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Daniel Cowles
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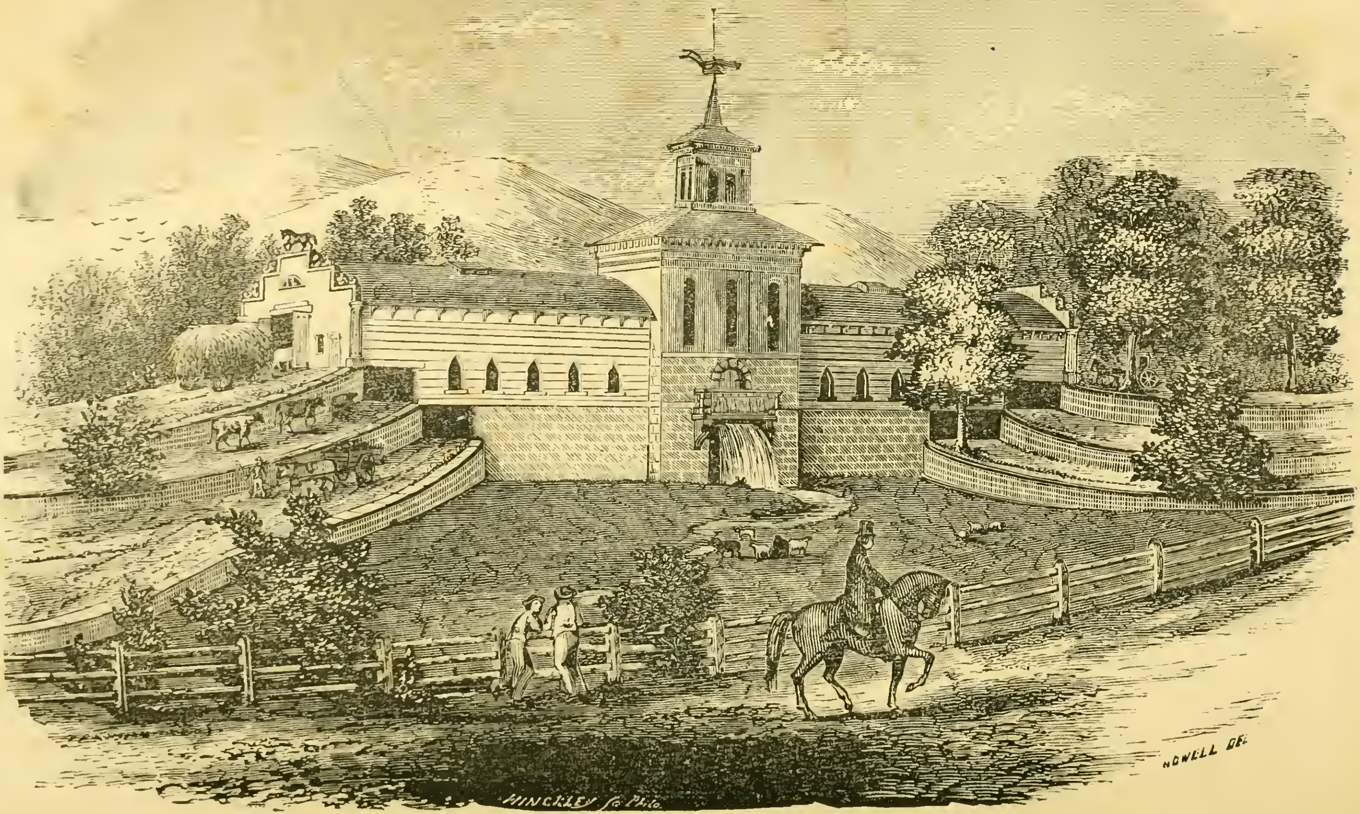
J. W. Boyden


HOWELL DEL
HINCKLEY Sc. Phila

CASCADE BARN.

Built at "Brookside," Great Barrington, by DAVID LEAVITT, Esq. J. WILKINSON, *Architect.* [*See Page* 219.]

SECOND ANNUAL REPORT

OF THE

SECRETARY

OF THE

Massachusetts Board of Agriculture,

TOGETHER WITH

THE REPORTS OF COMMITTEES

APPOINTED TO VISIT THE COUNTY SOCIETIES,

WITH AN APPENDIX,

CONTAINING AN ABSTRACT OF THE

FINANCES OF THE COUNTY SOCIETIES.

BOSTON:
WILLIAM WHITE, PRINTER TO THE STATE.
1855.

BOARD OF AGRICULTURE, 1855.

EX OFFICIIS.

His Excellency HENRY J. GARDNER.
His Honor SIMON BROWN.
EPHRAIM M. WRIGHT, *Secretary of State.*

APPOINTED BY THE GOVERNOR AND COUNCIL.

NATHANIEL WOOD, *of Fitchburg.*
EDWARD HITCHCOCK, *of Amherst.*
MARSHALL P. WILDER, *of Dorchester.*

CHOSEN BY THE SOCIETIES.

Massachusetts,	ROBERT C. WINTHROP, *of Boston.*
Essex,	MOSES NEWELL, *of West Newbury.*
Middlesex,	SAMUEL CHANDLER, *of Lexington.*
Middlesex, South,	WILLIAM G. LEWIS, *of Framingham.*
Worcester,	JOHN BROOKS, *of Princeton.*
Worcester, West,	WILLIAM PARKHURST, *of Petersham.*
Worcester, North,	IVERS PHILLIPS, *of Fitchburg.*
Hampshire, Franklin and Hampden,	GEORGE W. HUBBARD, *of Hatfield.*
Hampshire,	JOHN A. NASH, *of Amherst.*
Hampden,	FRANCIS BREWER, *of Springfield.*
Franklin,	HENRY W. CLAPP, *of Greenfield.*
Berkshire,	JUSTUS TOWER, *of Lanesborough.*
Housatonic,	JOHN WILKINSON, *of Gt. Barrington.*
Norfolk,	BENJAMIN V. FRENCH, *of Braintree.*
Bristol,	J. H. W. PAGE, *of New Bedford.*
Plymouth,	SETH SPRAGUE, *of Duxbury.*
Barnstable,	C. B. H. FESSENDEN, *of Sandwich.*

CHARLES L. FLINT, *Secretary.*

SECOND ANNUAL REPORT

OF THE

SECRETARY

OF THE

BOARD OF AGRICULTURE.

To the Senate and House of Representatives of the Commonwealth of Massachusetts :—

In a Report which I had the honor to submit to the Legislature in January last, I took occasion to say, that "the want of reliable and accurate experiments in Agriculture is now very generally felt, and it has been the desire of the Board to have such conveniences as would enable them to conduct a series of experiments in such a manner as to secure the confidence of the community. Those made by individuals in various parts of the State have been very valuable, and in some cases very costly, but as long as there is no concert of action, our ignorance and confusion of ideas respecting the many questions still remaining to be answered, in agricultural science, will continue. It has been thought that if a tract of land sufficiently large, and with such a variety of soils as would make it convenient for carrying on experiments, could be provided, the Board of Agriculture would be able to do something by which these evils might be gradually remedied, and the wants of the farming community supplied. No provision has, as yet, been made to enable the Board to direct special attention to this subject.'

The Board had examined the farm connected with the State Reform School at Westborough, and finding it well adapted for the purpose, and that the Trustees of that institution were desirous to forward so important an object, resolved to petition the Legislature for an Act authorizing the transfer of the farm into the hands of the Board of Agriculture. This was accordingly done by a committee acting in conjunction with a committee of the Trustees, and the following paper was presented

To the Honorable the Senate and the House of Representatives of the Commonwealth of Massachusetts in General Court assembled:—

The subscribers, a committee of the Trustees of the State Reform School, and a committee of the State Board of Agriculture, and in behalf of said Boards, respectfully pray your honorable body to pass an Act authorizing the Trustees of the State Reform School to place the whole or any part of the lands at Westborough, owned by the Commonwealth, under the charge of the State Board of Agriculture, for such term and on such conditions as may be agreed upon by the two Boards, and to authorize the Board of Agriculture to hold and manage the same; and also respectfully pray your honorable body to grant an appropriation to the State Board of Agriculture of the sum of ——— thousand dollars, for the purpose of permanent improvements and agricultural experiments, and to defray the ordinary expenses of said farm for the current year.

And as in duty bound, your petitioners will ever pray.

DANIEL H. FORBES,
HARVEY DODGE,
J. H. W. PAGE,
Committee of the Trustees of the State Reform School.

MARSHALL P. WILDER,
SETH SPRAGUE,
SIMON BROWN,
CHARLES L. FLINT,
Committee of the State Board of Agriculture.

January 26, 1854.

The Committee of the Senate and House of Representatives, to whom this petition was referred, made the following

REPORT.

The object of the State Reform School was the reformation of juvenile offenders. For the double purpose of supplying milk, vegetables, and other needful agricultural products, and also affording useful and healthful employment to the inmates, a farm was connected with the school; with some recent purchases, it now contains about 285 acres.

Its location is beautiful, and it embraces great variety of soil and surface, is well adapted for the usual modes of cultivation and for agricultural experiments, and may be made both very attractive to the eye, and very productive. By the Act establishing the State Reform School, the farm is placed under the charge of the Trustees. Much money has been expended upon it, very considerable improvements have been made, and its products have been as great as could, under all circumstances, be reasonably anticipated. But excellent qualifications for the oversight of the school do not necessarily imply either taste or skill in agriculture, and, in point of fact, it is believed that the appointments of Trustees have generally been made without any reference to experience or skill in agriculture, or ability to direct the conduct of the farm. The Trustees have found the charge of the farm a hinderance to them in the performance of their duties more immediately concerning the school. It would be a relief to them to be permitted to transfer to others that portion of their responsibilities. The buildings have been enlarged during the past year, and now furnish accommodations for 550 or 600 inmates, and that number will probably soon be reached. The faithful and judicious oversight and management of such an institution demand as much time and care as the Commonwealth ought to expect any unpaid Board of Trustees to devote to a public duty.

Since the establishment of the State Reform School, the State Board of Agriculture has been created. It is composed of men of science and men of practical skill in agriculture, and all deeply interested in that most important subject. The Board has also been fortunate in securing the services of a competent, faithful and zealous Secretary, well skilled both in the theory and practice of agriculture. If that Board had existed when the Reform School was established, the convenience and propriety of placing the farm under its charge could not have failed to attract attention.

The Board of Agriculture would be gratified to secure land upon which various modes of cultivation may be thoroughly tried, and a series of experiments instituted to test the value of the various concentrated and other manures which are so constantly urged upon the attention of farmers. Your committee are of opinion that the interest and the wishes of farmers, as a body, require that such experiments should be made, and reliable results ascertained. The farm at Westborough is admirably adapted for the purpose.

The Trustees of the State Reform School and the State Board of Agriculture are both children and agents of the State; both Boards were instituted and both labor for the same end—the good of the State. The only question is, Which Board can most conveniently and profitably have charge of a particular portion of State property?

Heretofore the farm has been improved and cultivated at the expense of the State, and the State has furnished consumers of all its products, with the exception of small quantities of fruit, &c., which have been sent to market. A much larger amount of agricultural products will be required for the establishment, and it is believed that, under the best management, a much larger amount may be produced without proportionate increase of expense. Further permanent improvements are required, and ought to be made, under either Board. As the State consumes all the products of the farm, no money can be realized from their sale, and consequently the State must furnish funds to make necessary permanent improvements and pay current expenses.

The members of the two Boards are unanimous in their views, and an arrangement is contemplated by which the Trustees of the Reform School will, at a stipulated price, furnish boys to work upon the farm, and to a much greater extent than it has been heretofore found expedient or profitable to employ them in agricultural labor; and the Board of Agriculture will supply the institution with milk, vegetables and other needed products of the farm, do the cartage of coal, &c. Thus the labor of the boys and the products of the farm will be applied for the benefit of the State, substantially as heretofore, only under different directions.

The bulk of the farm will undoubtedly continue to be carried on under the usual improved modes of cultivation, while a small portion will be devoted to the experiments of which we have spoken.

GEORGE W. HUBBARD, *Chairman.*

The Legislature, never slow to encourage the interests of agriculture whenever the means are shown to be judicious and practicable, passed the following

ACT.

SECT. 1. The Trustees of the State Reform School are hereby authorized to place under the charge of the State Board of Agriculture the whole or any part of the lands at Westborough, owned by the Commonwealth, except such portion thereof as may be required for the use of the school, for any term not exceeding ten years, and upon such conditions as may be agreed upon by the two Boards; and the State Board of Agriculture is hereby authorized to take charge of and manage said lands as fully as the said Trustees are now authorized by law to do.

Sect. 2. For the purpose of permanent improvements upon said lands and of agricultural experiments thereon, and to defray the ordinary expenses of the same for the current year, said Board may, by its Secretary, and as the same may be required, draw upon the Treasurer of the Commonwealth for a sum not exceeding in the aggregate six thousand dollars, to be paid from such funds as may be in the treasury; and the Governor is hereby authorized to draw his warrant upon the Treasurer for the sum of six thousand dollars, to remain in the treasury, subject to the drafts above provided for.

Sect. 3. The Board of Agriculture shall, in the annual report report required by law, make a full report of all sums expended upon said farm each year that it may be under their charge, and of all their doings in relation to said premises, and the results thereof.

Sect. 4. This act shall take effect from and after its passage.

Measures were immediately taken to effect a transfer of the farm by a committee appointed for that purpose, to act with a committee of the Trustees of the State Reform School; and at a meeting of the Board of Agriculture, held at the State House on the 11th of April, that committee submitted the following

REPORT.

The committee to whom was referred the subject of the transfer of the farm at Westborough, met a committee from the Trustees of the State Reform School at the farm on the 24th of March, at which time the writings were signed and the transfer was duly made, and on the 29th of the same month the same committees appraised the property delivered into the hands of the Board of Agriculture. The committee of the Board of Agriculture have contracted with the farmer employed the last year by the Board of Trustees to continue in charge of the same. The Act of the Legislature authorizing the transfer, the agreement of the committees of the two Boards, and the details of the appraisal of the property, are respectfully submitted.

Seth Sprague.
Simon Brown.

Boston, April 10, 1854.

The Act of the Legislature was formally accepted at this meeting, and the agreement between the Trustees of the State Reform School and the Board of Agriculture was approved. The following is the

CONTRACT.

By authority of an Act of the Legislature of Massachusetts, entitled "An Act relating to the State Reform School and the State Board of Agriculture," approved by the Governor February 27, 1854, a certified copy of which is prefixed to this instrument, the Trustees of the State Reform School do hereby transfer to and place under the charge of the State Board of Agriculture all the lands and tenements at Westborough, owned by the Commonwealth, excepting and reserving the premises bounded, southerly by the lower edge of the embankment in front of the main building of the State Reform School, as the said embankment now is or may be made; westerly by the fence near the grove, and the line of said fence extended to the highway; northerly and easterly by the highway; and also excepting and reserving the store-house east of the main building, the Peters House, so called, and the shop on the easterly side of the highway, together with the land under, and suitable land around said buildings, for the convenient use of the same; said Trustees also reserving to themselves and their successors the right to have such portion of said premises as they may see fit for the site and accommodation of such dwelling-houses or other buildings as they may hereafter find it expedient to erect; and said Trustees also do hereby transfer to said Board of Agriculture all the neat cattle, swine, implements of husbandry, horses, carriages, and other personal property belonging to the Commonwealth, and now upon said premises, excepting such horses, carriages, and harnesses as said Trustees may elect to reserve for the immediate use of said State Reform School; a schedule and valuation of all which real and personal property so transferred shall be made by a committee of two members of said Board of Trustees and two members of said Board of Agriculture annexed to this instrument, and taken as part thereof.* And the State Board of Agriculture hereby assumes the charge of the said real and personal property as fully as said Board is authorized to do by the Act above referred to. The purpose of this arrangement is to relieve the Trustees of the State Reform School of the care and management of the agricultural portion of the establishment at Westborough, to provide an experimental farm for the Board of Agriculture, and to furnish greater facilities for the employment and instruction of the inmates of the Reform School in agriculture and horticulture, in accordance with what are believed to have been the views and wishes of General Theodore Lyman, the founder of the institution, while the products of the farm shall continue to be applied for the use of the school substantially as they were while the farm was under the immediate control of said Board of Trustees.

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* See Appendix A.

In order to carry that purpose into effect, it is agreed by and between the Trustees of the State Reform School and the State Board of Agriculture as follows: The State Board of Agriculture shall cause to be done all the teaming and transportation, except of persons, and all other necessary out-door work for the Reform School; shall furnish for the school all milk, vegetables, and other products of the farm, which may be desired by the Trustees, and not required for the use of the agricultural department, for consumption on the premises; shall cause the water for the use of the institution to be furnished by the engine in sufficient quantities; shall do for the school all such necessary grinding and sawing as the mill may be capable of performing, and shall provide competent and suitable men to oversee and instruct the inmates of the school when at work on the farm, or otherwise, under the direction of the Board of Agriculture. The Trustees of the State Reform School shall furnish to the Board of Agriculture boys from the school to work upon the farm, or to do other work, under the direction of said Board, in such numbers as may be required by said Board, to such extent as the condition of the school will admit; reasonable notice to be given from time to time of the numbers to be required. The Trustees of the State Reform School shall furnish to the Board of Agriculture all the offal from the institution, to be removed at reasonable and stated times by said Board.

Each of said Boards shall cause to be kept accurate accounts with the other, with a debt and credit side, and the mutual accounts shall be examined and adjusted, and the balance paid in cash, in the month of November in each year, and also at the expiration of the term herein-after limited.

The Trustees of the State Reform School shall charge the Board of Agriculture three hundred and fifty dollars a year for said offal, ten cents for each boy furnished to work for the Board of Agriculture for each day of six hours, and an agreed price or the fair value for any other thing that may be furnished by said Trustees to said Board of Agriculture. The State Board of Agriculture shall charge the Trustees of the State Reform School eight hundred dollars a year for pumping water, and keeping apparatus and pipe in order up to said embankment; and an agreed price, or, in the absence of any agreement, usual and current prices at Westborough, for grinding and sawing, for all teaming and other work done for, and for agricultural products and other articles furnished to, the Trustees by the Board of Agriculture.

This arrangement shall go into effect on the first day of April, in the year eighteen hundred and fifty-four, and, in order to give the plan a fair trial, shall continue in force for the term of five years, subject to such modifications as experience may suggest, and as may be mutually agreed upon by said Trustees and said Board of Agriculture; any such modifications to be indorsed on this instrument: *Provided, always*, that it shall be competent for the Legislature at any time to annul this agreement, and to place said premises and property under the charge of said Trustees as fully as the same were before said Act was passed.

In testimony whereof, Harvey Dodge, Daniel H. Forbes, G. Howland Shaw, and J. H. W. Page, a committee of the Trustees of the State Reform School for this purpose specially appointed, and Marshall P. Wilder, Seth Sprague, Simon Brown, and Charles L. Flint, a committee of the State Board of Agriculture for this purpose specially appointed, have, in behalf of said Boards respectively, hereunto set our names interchangeably, at Westborough, this twenty-fourth day of March, in the year eighteen hundred and fifty-four.

MARSHALL P. WILDER,
SETH SPRAGUE,
SIMON BROWN,
CHARLES L. FLINT,
Committee of the State Board of Agriculture.

HARVEY DODGE,
DANIEL H. FORBES,
G. H. SHAW,
J. H. W. PAGE,
Committee of the Trustees of the State Reform School.

Subsequently to this agreement, it was thought desirable by both Boards that the pumping of water for the institution should be done under the direction of the Trustees of the State Reform School, as also the sawing and grinding for the same; and these labors have accordingly been so performed, that part of the above contract having been virtually annulled by mutual understanding.

At this meeting, also, a series of By-Laws was adopted for the management and regulation of the farm, as follows:—

SECT. 1. The principal objects of the Board of Agriculture are, to relieve the Trustees of the State Reform School of the care and management of the agricultural portion of the establishment at Westborough, to provide a farm for the Board where experiments may be made in stock and the various crops and fertilizers, and to furnish greater facilities for the employment and instruction of the inmates of the Reform School, in agriculture and horticulture, in accordance with what is believed to have been the views of Gen. THODORE LYMAN, the founder of the institution; and with a view to carrying out these objects of the Board, and giving opportunity for discussing its interests and maturing and carrying out its plans, the annual meeting of the Board shall be at the State House on the first Wednesday of January, at 10 o'clock A. M., at which time the several committees of the Board shall be elected. Its quarterly meetings shall be held on the farm, at Westborough, on the first Wednesday of April, on the first Wednesday of July, and on the third Wednesday of October, at 10 o'clock A. M. of each year.

SECT. 2. There shall be annually elected by the Board a Superintending Committee of the farm at Westborough, consisting of eight members, whose duty it shall be, in connection with the Secretary, so far as the same may be consistent with a performance of his other duties, to meet at said farm once in each month, and as much oftener as they may deem necessary, to make such arrangements and give such directions to the farmer as the various crops, trees, stock, and other interests of the farm may require, and shall make a full report of their doings to the Board at its quarterly meetings. And said committee may be subdivided into smaller committees, in such manner as they may see fit, each of which shall keep accurate memoranda or records of their doings, and report the same, from time to time, to the Secretary; and it shall be his duty, from these reports and such other means of information as he may possess, to keep a record of the lots under cultivation, with their number and contents in measure; of the manner of draining, reclaiming, ploughing, cultivating and manuring, stating the kind of land in use, the kind and quantity of the fertilizer used, when and how applied, the state of the atmosphere when applied, and the amount of each crop gathered, together with the results of the whole process.

SECT. 3. The Secretary shall notify members of the times of meeting of the Board, call its committees together whenever three or more members of a committee shall deem it necessary, keep a journal of the proceedings of each meeting, and attend to such correspondence as shall promote the objects of the Board. He shall prepare, or cause to be prepared, all documents, statements and notices which may directed by the Board or its committees, and communicate to it all proceedings relative to its financial concerns.

SECT. 4. The Superintending Committee shall appoint a farmer, and such other persons as they may think expedient, for the management of the farm. The farmer shall have charge of all the farming operations, and shall be responsible for the proper management, good order and economical use of every thing connected therewith.

He shall carry forward such general improvements and make such purchases of stock as the said committee may direct. He shall also, under the direction of the committee, attend to engaging and discharging the adult help that may be employed on the farm, and shall be responsible for the character and conduct of the same, and shall perform such other duties as may be assigned to him by the committee.

Every evening he shall make known to the Superintendent of the Reform School what work he intends shall be performed by boys on the following day, and the places where they are to be employed, in order that, in assigning boys to the work, regard may be had to their qualifications, character and exposure, and such assignment be made as will most effectually guard against escapes, and also secure the best advantage from their labor. He shall have charge of the boys while employed on the farm, shall receive and return them punctually, as required by the Superintendent, and see that the rules of the institution respecting their discipline are strictly observed while they are under his care.

He shall cause all merchandise, fuel, and whatever else is required for the use of the institution, to be drawn by the teams of the farm, and shall perform any other labor with men, boys and teams at the request of the Superintendent of the school, when not inconsistent with his duties upon the farm, and fully carry out the agreement made between the Board of Trustees and the Board of Agriculture.

He shall keep a correct account of all receipts and expenditures relating to the farm, and of all labor performed thereon, and shall furnish to the Board an annual report of the same, with schedules of the articles purchased during the year, and of the stock and farming implements on hand, and may communicate such other information, and make such suggestions, as he may think will be useful.

He shall see that all the regulations of the Board and of the institution are strictly observed by all persons employed by him, and shall promptly discharge any who refuse or neglect to comply with them cheerfully.

SECT. 5. There shall be a Finance Committee of three persons, whose duty it shall be to approve the drafts of the Secretary before drawing money upon them from the treasury, and also to approve all bills presented for payment.

SECT. 6. There shall be a committee of three persons to examine and compare the vouchers returned by the Secretary, and audit the accounts at the close of each fiscal year.*

Messrs. M. P. Wilder, B. V. French, Simon Brown, Moses Newell, H. W. Clapp, J. A. Nash, John Brooks, and Seth Sprague were appointed a Superintending Committee, to which was intrusted the entire management and responsibility of the farm.

That committee appointed four subcommittees. Messrs. French and Brown, on general improvements, farm arrangements, plans, &c. Messrs. Brooks and Newell on stock, including the sale, keeping, &c. Messrs. Wilder and Nash on crops, including fertilizers, &c.; and Messrs. Sprague and Clapp on labor. One of these committees was directed to visit the farm each week, and report at the meeting of the Superintending Committee at the beginning of each month.

It will be seen by the date of the contract that the season was considerably advanced before the plans of the Board could be perfected; consequently, the labors of the present year were conducted under great disadvantages. No arrangements could be made, and no plans be formed, without a constant reference to the wants and necessities of the Institution for the supply of which that farm was intended.

The Board had no expectation of making what is sometimes called a "model farm," nor indeed any desire to do so. Neither the circumstances of the place nor the means at their disposal were suitable to this. The greater part of the land was to be cultivated in a plain, practical way, so as to meet the demands for produce, while some part of the crops might be subjected to experiments of various kinds, that, by their careful conduct, some questions in which the community were deeply interested might be settled.

For these reasons it is obvious that but few experiments could be advantageously made during the first year. Moreover, the character of the soil and its previous treatment were in a great measure unknown; and owing to the lateness of the season, all the work was necessarily crowded into a very short time. The experiments that have been made, however, are not without their interest and value. They will be found in detail in the reports of the various committees hereafter. It is the design of the Board to extend them, and to conduct them in such a manner as to secure perfect accuracy.

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* See Appendix, B.

To be of any value, experiments require the expenditure of much time and labor, much skill, a constant watchfulness, and many facilities which are not often at the command of an individual. The State can make them at little expense, comparatively; and though they must, for the reasons stated, be a secondary object at the farm at Westborough, it is of the utmost importance to secure all possible accuracy in making them, that they may have the respect and confidence of those interested in them.

It will be seen by the Report of the Committee on Improvements, made at an adjourned meeting of the Board, held on the 5th of December, that the wants of the State Reform School have increased to such an extent, and the location of the farm buildings is such, that it is very important to purchase land adjoining the farm. This adjoining land can be obtained at a reasonable rate, and it is evidently for the interest of the State to secure it, both because it is really needed to enable the farm to meet the growing wants of the Institution, and because it would vastly improve the condition of the farm itself. This subject is well alluded to in the following

REPORT.

Your committee had charge of the general improvements, farm arrangements, plans, &c., on the farm at Westborough. They have erected a piggery,* containing a commodious store-house and slaughter-house, 30 feet by 86, with 14 feet posts, and so constructed as to admit of storing straw, roots, &c., in the loft. They have converted an old barn into a tool-house,* carpenter's shop, seed room, blacksmith's shop, &c.; have laid drains in the barn-cellar to carry off the

* See Appendix, C.

spring water; and have commenced to build two reservoirs for the reception of the sewerage from the Institution.

The plan made from a survey of the farm induces your committee to hesitate before proceeding further. By the plan it will be seen that the farm is an ill-shapen affair, and is one that your committee would not select as being likely to succeed as a model or experimental farm.

The barn is located on a point of the farm, instead of the centre; and the consequence is, that all the manure must be hauled a considerable distance to the fields, and the hay and other crops an equal distance to the barn. The cattle must be driven nearly half a mile to and from the pasture; and these operations, and many others like them, involve much expense of time and labor. Your committee, therefore, before recommending any course of improvement for the coming year, would earnestly recommend the purchase of more land, for the sake of improving the shape of the farm, as well as to bring more tillage land near the barn. Such lands, moreover, are actually wanted to increase the resources of the farm in some proportion to the increase of the wants of the Institution. It is known to the Board that we must have more farm buildings. The farm house is wholly inadequate to the wants of the farm, and the workmen have been boarded out, for want of accommodations, all the past summer. Your committee have taken measures to ascertain that much of the land contiguous to the farm can be had at a reasonable price. By the purchase of these lands some tenements and out buildings will be obtained, which, though not such as the committee would desire, will yet answer the purposes of the farm for some years, till a suitable farm house can be erected. It is a matter of great importance that these lands should be purchased immediately. Since the State Reform School has been located on the grounds at great expense, it is not probable that it will ever be removed. The number of its inmates and its usefulness will, on the other hand, be greatly extended. This additional land, also, will give employment to the boys for time to come, and the products will always be needed at the Institution.

Your committee are, therefore, induced to await the decision of the Board and of the Legislature before proceeding to lay out the general improvements to be undertaken for the ensuing year.

Respectfully submitted.

B. V. French.
Simon Brown.

The remarks of the committee on stock will also show that the resources of the farm, within its present limits, are not adequate to supply the wants of the school, and that it has been found necessary to purchase hay and to hire pasturage to keep even the number of cows already there. The experiments made under the direction of this committee, though necessarily limited in extent, are of great interest. They appear in the following

REPORT.

The undersigned, Committee on Stock, have attended to their duty as diligently as circumstances would permit. They have charge of all the stock of the farm, including farming utensils. Among the live stock under their care they have had thirty-five swine and twenty-three milch cows. The swine were valued, on the first day of April last, at $575, and have mostly been sold, and their places made good by their young descendants ; and their number had increased, on the first of December, to seventy-five, and their value decreased to $558. We have now on hand in value, of swine, within $17, as much as in April last, and a considerable amount of pork has been sold. The cows have produced, up to the first day of December, 6,469½ gallons of milk and 511 pounds of veal.

The relation between the quantity and value of food consumed by dairy cows, and the milk, butter or cheese produced, has never been satisfactorily settled in this State ; and although we may believe that cows in general consume food in proportion to their live weight, and yield milk or some other product in proportion to the food consumed, we have no satisfactory proof of the fact. In order to elicit some information upon this subject, the undersigned obtained the consent, in June last, of the superintending committee, to make such experiments with the milch cows as they should deem expedient. In pursuance of this consent, they directed Mr. White, the farmer, to weigh the milk of each cow night and morning daily, and to weigh each cow on the evening of the tenth and morning of the eleventh day of each month ; but owing to the hurry of the work on the farm and other circumstances not under his control, he omitted to execute the order, and the experiments are limited to the weighing of the milk for ten days, from the twentieth to the thirtieth of June, and for ten days, from the twentieth to the thirtieth of August, and the weighing of the cows on the morning of the eleventh and the evening of the tenth of June and the evening of the thirty-first of August and the morning of the first of September—too short a time to afford a basis for conclusive deductions. They however afford, as will be seen by the tables, some useful information.

Weight of twenty-one Cows, belonging to the State Farm, Westborough, on the evening of the 10*th of June and the morning of the* 11*th; also, a memorandum of Milk given by the same Cows, in ten days, from the* 20*th to the* 30*th of June.*

Names of Cows.	Age.	Morning weight.	Evening weight.	Average morning and evening weight.	Difference between morning and evening weight.	Number of days after calving.	Yield of milk in ten days.	Daily yield of milk.	Per cent. of milk daily on average live weight.
Gentle, ...	9	990	1,040	1,015	50	242	226	22.6	2.22
Fanny, ...	10	995	1,050	1,022	55	232	201.5	20.1	1.97
Flora, ...	5	915	965	940	50	224	328.0	32.8	3.48
Rosa, ...	9	940	990	965	50	216	216.5	21.6	2.24
Chamberlin, . . .	7	1,095	1,150	1,122	55	304	165.0	16.5	1.47
Delia, ...	7	945	1,000	972	55	214	159.5	15.9	1.62
Redneck, . . .	5	730	790	760	60	190	191.5	19.1	2.52
Haywood, . . .	9	940	995	967	55	224	156.0	15.6	1.61
Nancy, ...	9	940	1,000	970	60	168	158.5	15.8	1.63
Whiteface, . . .	5	720	785	752	65	202	198.0	19.8	2.62
Spot, ...	6	840	890	865	50	120	109.0	10.9	1.26
Redheifer, . . .	5	815	870	842	55	60	319.0	31.9	3.79
Young Gentle, . .	5	920	980	950	60	29	348.5	34.8	3.87
Bunty, ...	5	830	900	865	70	108	349.0	34.9	4.03
Sawyer, ...	5	850	910	880	60	88	359.5	35.9	4.08
Kendall, ...	8	965	1,020	992	55	84	319.0	31.9	3.21
Dolly, ...	10	1,100	1,150	1,125	50	49	377.5	37.7	3.35
Grizzle, ...	9	1,020	1,080	1,050	60	65	226.0	22.6	2.16
Star, ...	10	965	1,020	992	55	76	328.0	32.8	3.30
Nelly, ...	6	930	990	960	60	48	299.5	29.9	3.12
Cherry, ...	5	760	820	790	60	63	278.5	27.8	3.52

Average loss on each cow between evening weight, when full, and morning weight, when empty, 56.66 pounds. Average loss per cent. on evening weight, 5.83. Nine cows from eight to ten years old inclusive, average age nine years and three months, and weighing 9,345 pounds evening weight, lost in the morning 490 pounds. Average loss on each cow, 54.44 pounds. Average loss per cent. on the evening weight of each of the nine cows, 5.24 per cent.

Twelve young cows, from five to seven years old inclusive, average age five years and six months, and weighing 11,050 pounds evening weight, lost in the morning 700 pounds. Average loss on each cow, 58.33 pounds. Average loss per cent. on evening weight of each of the twelve cows, 6.33. The twelve young cows lost 1.09 per cent. more between evening and morning weight than the nine old cows. Six of the twelve young cows were milked both morning and evening before weighing, and but two of the nine old cows were milked before weighing. This may account in part for the greater loss on the young cows.

The number of days after calving of the nine old cows was 150.6, while the number of days after calving of the twelve young cows was 137.5. This may be another reason why the young cows lost more between morning and evening weight than the old cows. Average number of days after calving, 143. Daily average of milk 143 days after calving, 25.28 pounds. Daily average of milk on the average morning and evening weight, 2.83 per cent. The average time after calving of the nine old cows was 150.6 days, and their daily flow of milk was 2.37 per cent. on their average weight.

The average time after calving of the twelve young cows, 137 days, and their daily flow of milk, was 3.30 per cent. of their average weight. The daily flow of milk from the twelve young cows being greater than that from the nine old cows, the difference between the evening and morning flow would be greater; hence, an additional reason for the greater loss between the evening and morning weight of the young than the old cows.

Weight of seventeen Cows, belonging to the State Farm in Westborough, on the evening of the 31*st of August and the morning of the* 1*st of September, and a memorandum of milk given by twelve of the same Cows, from the* 20*th to the* 30*th of August, (ten days.)*

Names of Cows.	Age.	Morning weight.	Evening weight	Average morning and evening weight.	Difference between morning and evening weight.	Number of days after calving.	Yield of milk in ten days, in pounds.	Daily yield of milk, in pounds	Per cent. of milk daily on average live weight.
Fanny, ...	10	1,040	1,090	1,667	50	–	–	–	–
Flora, ...	5	1,020	1,075	1.047	55	–	–	–	–
Lady, ...	4	935	990	962	55	–	–	–	–
Bessey, ...	4	880	935	907	55	–	–	–	–
Redneck, . . .	5	845	880	862	35	250	96.80	9.68	1.12
Nancy, ...	9	1,035	1,080	1,052	45	228	109.40	10.94	1.04
Whiteface, . . .	5	795	840	817	45	262	110.60	11.06	1.35
Redheifer, . . .	5	820	870	854	50	120	141.90	14.19	1.66
Young Gentle, . .	5	855	930	892	75	89	196.80	19.68	2.20
Sawyer, ...	5	900	950	925	50	148	143.10	14.30	1.62
Bunty, ...	5	855	905	880	50	168	173.70	17.37	1.88
Kendall, ...	8	960	1,000	980	40	–	–	–	–
Dolly, ...	10	1,115	1,175	1,145	60	109	171.40	17.14	1.49
Grizzle, ...	9	1,020	1,160	1,040	40	125	145.00	14.50	1.40
Star, ...	10	975	1,025	1,000	50	136	176.80	17.68	1.77
Nelly, ...	6	895	945	920	50	108	135.00	13.50	1.46
Cherry, ...	5	780	825	802	45	123	116.20	11.62	1.45
		15,725	16,575	15,152	850				

Average loss on each cow between evening weight, when full, and morning weight, when empty, 50 pounds. Average loss per cent. on evening weight, 5.12.

Six cows from eight to ten years old, inclusive, average nine years and four months, weighed 6,430 pounds evening weight. Loss on this weight, in the morning, 285 pounds. Average loss on each cow, 47.50. Loss per cent. on evening weight, 4.43.

Eleven cows from four to six years old, average four years and nine months, weighed in the evening 10,145 pounds. Loss on this weight in the morning, 565 pounds. Average loss on each cow, 51.36 pounds. Average loss per cent. on evening weight, 5.56. The eleven young cows lost 1.14 per cent. more than the six old cows.

The average number of days after calving of the twelve cows that gave milk during the ten days was 155½. Daily average yield of milk of the same cows, 14.30 pounds each. Average milk on average weight of the same cows, daily, was 1.53 per cent. The average falling off in milk of these twelve cows, since the thirtieth of June, is 1.63 per cent. of their average live weight.

The committee would suggest the expediency of an application to the legislature for a grant of funds, to enable the Board to continue the experiments, and to try others which are calculated to determine the individual and comparative value of the different breeds of cattle, and the comparative value of the several kinds of roots grown in the State, with good English hay, corn-fodder and other substances usually fed to cattle.

JOHN BROOKS.
MOSES NEWELL.

The principal crops raised on the farm during the past season were: 1,393 bushels of potatoes; 1,819 bushels of Indian corn as taken from the field, or 909½ bushels of shelled corn; 2,258 bushels of carrots; 70 tons of hay; 1,119 bushels of ruta-bagas, and sufficient quantities of the various smaller products, as pease, beans, beets, squashes, &c., for the use of the institution.

The experiments detailed in the report of the Committee on Crops will be found to be of great value and interest, though not in all respects so satisfactory as they would have been had the season proved more favorable. It has been already stated that the subject of fertilizers was put into the hands of this committee. This is a matter of vast importance to the community, for on these depend the success and profit of every operation on the farm. These experiments relate to the comparative value of stable manure and guano, super-phosphate of lime, potash, &c. They will appear best in the following

REPORT.

The undersigned, a sub-committee of the Superintending Committee of this Board for carrying on the operations of the State Farm at Westborough, submit the following Report

"ON CROPS, INCLUDING FERTILIZERS, &c."

In pursuance of the duty assigned, your Committee visited the Farm in the spring, and after consultation with Deacon White, the farmer, in relation to the wants of the Institution, and the capabilities of the soil, gave such directions as appeared to them to be the best adapted to promote the interests of the Commonwealth and the objects of the Board.

Among the latter were certain experiments with fertilizers, for the purpose of ascertaining their value, and their adaptation to various crops and soils.

Before proceeding with a statement of the results of the experiments, it should be mentioned that, from unforeseen and providential circumstances, it was impossible to commence some of them until the season was too far advanced for a favorable trial. Other difficulties have since occurred, which were not anticipated, and which have prevented so accurate and satisfactory a report as might be desired. Among these may especially be named the unparalleled drought so generally disastrous to vegetation throughout the country.

Your Committee herewith submit the subjoined statement of the products derived from the department under their charge, without estimating the cost of production or the value of the crops, since these will be found in the accounts of the farmer, rendered to the Secretary of the Board.

CORN CROPS.

There were twenty-one acres in one field, and the soil was of a light, loamy character. The crop for the previous three years had been hay. The land was ploughed eight inches deep, and furrowed both ways thirty-six by thirty inches. Fifteen acres of the above were manured with manure from the barn, spread and ploughed in, at the rate of twenty-five cartloads of thirty-four bushels each, or eight and one-third cords to the acre, a cord estimated to contain one hundred and two bushels.*

The remaining six acres were divided into six equal lots, were manured at equal expense, and subjected to the following experiments :—

Lot No. 1.—This was fertilized with ten dollars' worth of reservoir manure from the sinks of the institution, mixed with soil, estimated at its comparative value with stable manure, and it produced 87 bushels of ears, or of shelled corn 43½ bushels per acre.

Lots Nos. 2 *and* 3.—These were dressed with ten dollars' worth of guano each to the acre, and produced 144 bushels of ears, or 72 bushels of shelled corn, being 36 bushels per acre.

Lot No. 4.—This was manured with ten dollars' worth of Mapes' super-phosphate of lime, and produced 85 bushels of ears, or of shelled corn 42½ bushels per acre.

Lot No. 5.—This was dressed with ten dollars' worth of De Burg's super-phosphate of lime, and produced 101 bushels of ears, or of shelled corn 50½ bushels per acre.

Lot No. 6.—This was dressed with ten dollars' worth of ground bone, and produced 90 bushels of ears, or of shelled corn 45 bushels per acre.

On Lots Nos. 2 and 3 the seed corn was destroyed twice by the strength of the guano, although it had been composted (see note) for some weeks.† The crop was therefore late, and much injured by the drought.

On lot No. 5, dressed with De Burg's super-phosphate of lime, the corn was the heaviest and stoutest, yielding only one bushel of soft, or pig, corn to the acre.

Thus it will be seen that of these lots, side by side, similarly constituted and cultivated, and fertilized at equal expense, the results were as follows :—

Guano, not fairly tried, produced . . .	36.6	per acre.
Mapes' super-phosphate of lime produced . .	42½	"
Reservoir manure produced	43½	"
Bone manure produced	45	"
De Burg's super-phosphate of lime produced .	50½	"

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* The barn manure was composed of 120 cartloads of loam, and 40 do. of meadow muck, to 220 loads of stable manure, and, when composted, estimated to be worth one dollar a load, or three dollars per cord. The fifteen acres produced 1,312 bushels of ears, or 656 bushels of shelled corn, or at the rate of 43 11-15 bushels per acre.

† The above fertilizers, previous to use, were mixed with five times their bulk of meadow muck, and applied to the several lots in the hill.

But, for reasons above stated, these results, in a different season and in other circumstances, may vary.

The weight of the stover, it will be seen below, does not exactly correspond with the grain, yet the largest yield produced also the greatest amount of fodder.

Guano,	2,740 pounds per acre.
Reservoir manure,	3,160 " "
Mapes' super-phosphate,	3,300 " "
De Burg's super-phosphate,	3,680 " "
Ground bone,	(Not weighed.)

Two acres of corn not included in the above were also planted with different kinds of corn. One of these was mostly sweet. Of this there was sold in the green state the amount of $\$41\frac{28}{100}$. The balance at harvest time yielded 23 bushels of ears of sweet, 8 of pop, and 10 of a white corn, had of Ruggles, Nourse & Mason. The other acre was planted with seed corn from Hadley, Mass., and yielded 110 bushels of ears, of a very beautiful quality. These two acres were fertilized with manure from the pigsty in 1853, at the rate of ten cords to the acre, and the same quantity this year. Last year the product was at the rate of 62½ bushels of shelled corn to the acre. This land lies north of the institution.

POTATOES.

Of these there were nine acres in cultivation.

The following experiments were made on the Sibley lot, containing five acres; soil light—rather sandy; ploughed seven inches deep, furrowed both ways, thirty-six by thirty inches, and planted with the St. Helena potato. This field produced corn in 1853, and was then manured with about seven cords of barn manure to the acre. This year the crop was hoed twice, but not hilled at all.

Lot No. 1.—This, like the others which follow, contained one acre. It was manured with barn manure, one-half spread and ploughed in, the balance put in the hill, at the rate of twelve dollars' worth to the acre. Product, 5,189 lbs., or, at 60 lbs. per bushel, 86½ bushels per acre.

Lot No. 2.—This was dressed with twelve dollars' worth of guano, and produced 5,535 lbs., or 92½ bushels per acre.

Lot No. 3.—This was dressed with twelve dollars' worth of Mapes' super-phosphate of lime, and produced 5,053 lbs., or 84¾ bushels per acre.

Lot No. 4.—This was dressed with twelve dollars' worth of DeBurg's super-phosphate of lime, and produced 4,641 lbs., or $77\frac{1}{3}$ bushels per acre.

Lot No. 5.—This was fertilized with super-phosphate of lime, at half the expense of the foregoing, say six dollars per acre, and produced 3,637 lbs., or $60\frac{2}{3}$ bushels per acre.*

Further Experiments on Potatoes.

Two acres were planted on the Warren lot. This was dressed in 1853 with hog manure, at the rate of eight and one-third cords, and about thirty bushels of coal-ashes to the acre. This year the land received to the acre 400 lbs. of guano, applied in the hill. The product was 359 bushels, or $179\frac{1}{2}$ bushels to the acre.

Lot below the House.—This also contained two acres, and had been mowed for three years without any dressing. Last year (1853) the land was broken up and cultivated with corn for fodder, without manure. This year it received, like the Warren lot, 400 lbs. of guano to the acre, and produced 379 bushels, or $189\frac{1}{2}$ bushels to the acre.

In all of the above cases the manure was applied in the hill.†

ROOT CROPS.

Experiments on the Field by the Barn.

The soil was a deep, good loam, ploughed from twelve to fifteen inches deep. The previous crop, in 1853, was ruta-baga turnips. The fertilizers named below were compounded with meadow muck as before stated, and were spread and deeply ploughed in, the cost of each being at the rate of twelve dollars per acre. Each lot contained twenty-eight square rods.

CARROTS.

Lot No. 1.—This was dressed with guano, and produced 6,354 lbs., or, at 55 lbs. per bushel, $115\frac{29}{55}$ bushels, or 660 bushels per acre.

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* The potatoes on lot No. 1 were small, but numerous and good. Those of Nos. 2, 3, 4 and 5 were all large and fine for the table.

† From these experiments, it will be seen that the results of these fertilizers in the potato crop vary with the results in the corn crops. De Burg's super-phosphate of lime, which produced the largest crop of corn, yielded the smallest crop of potatoes. Guano yielded the largest crop, even on land which had received no manure for four years, having been mowed three years, and last year cultivated with corn for cut fodder. In this instance, ten dollars' worth of guano produced $189\frac{1}{2}$ bushels of superior potatoes per acre. Similar results in America and England prove the value of this fertilzer, especially for potatoes.

Lot No. 2.—This was dressed with Mapes' super-phosphate of lime, and produced 5,505 lbs., or $100\frac{1}{11}$ bushels, or a fraction less than 572 bushels per acre.

Lot No. 3.—This was fertilized with De Burg's super-phosphate of lime, and produced 5,630 lbs., or $102\frac{4}{11}$ bushels, or a fraction less than 585 bushels per acre.

Lot No. 4.—This was dressed with potash, and produced 6,046 lbs., or about 110 bushels, or at the rate of 628 bushels per acre.

Lot No. 5.—This was manured with barn manure, and produced 7,255 lbs., or $131\frac{10}{11}$ bushels, or at the rate of 753 bushels per acre.

Experiments were also tried on two and a-half acres of old carrot ground, upon which this root had been grown for seven years—soil a light loam, ploughed ten inches deep.

Five-sixths of an acre was dressed with eighteen dollars' worth of potash, dissolved and mixed with sixty bushels of coal ashes. The product was 500 bushels, or 600 bushels to the acre, of as fine carrots as were ever seen.

One and four-sixths of an acre was manured with reservoir manure, estimated at its comparative value with barn manure, (say $8\frac{1}{3}$ cords to the acre.) The product was 900 bushels, or 540 bushels to the acre, but the carrots were neither as large nor long as those dressed with the potash and ashes.

From these experiments we learn that the various manures arrange themselves as to their productive energy in the following order, the cost of each being twelve dollars to the acre:—

Barn manure produced, of carrots, . .	753	bushels	per acre.
Guano, ...	660	"	"
Potash, ...	628	"	"
De Burg's super-phosphate, . . .	585	"	"
Mapes' " "	572	"	"
Reservoir manure, ...	540	"	"

The parsnip and onion crops were nearly a failure, occasioned by stagnant water on the land soon after sowing.

Of ruta-baga and other turnips, there were four acres, producing 1,119 bushels, or $279\frac{3}{4}$ bushels per acre. These were manured with barn-yard manure, at the rate of $8\frac{1}{3}$ cords to the acre.

The farm also produced crops of pease, beans, tomatoes, cabbages, beets, pumpkins, squashes, and other vegetables; apples, pears, quinces, and other fruits, most of which have been consumed from time to time on the premises, and of which the statistics need not here be given.

From the memoranda of the farmer, the following statement is collated in relation to the

HAY CROP.

English hay,	41	tons	1,300	lbs.
Meadow hay,	19	"	390	"
	60	"	1,690	"
*Oats for fodder,	9	"	0	"
English hay, purchased standing on Fay Farm,	23	"	700	"
Total amount of fodder,	93	tons	390	lbs.

In review of the foregoing statements, important facts may be deduced in regard to the relative value of fertilizers. Stable manures have always proved, and will doubtless continue to be, of standard value. We would by no means detract from their worth, but would urge the utmost care in their production, preservation and application. But where these are insufficient, and cannot be easily applied, others must be used, and it becomes a point of vast importance to agriculturists to ascertain their comparative value and adaptation to soils and crops. On this subject, our experiments, though tried in an unfavorable season, and less satisfactory than we could wish, reflect some light.

In relation to guano, they confirm the general sentiment which has obtained, both in this country and in England, from its use, and assign it a place among the most economical and valuable fertilizers. It possesses peculiar advantages in humid climates and in clayey and carbonaceous soils, where evaporation is less active than in thin or silicious grounds. Hence in England its use has been continually increasing; and here, as there, it has proved not only useful for all crops, but peculiarly successful in the potato and wheat crops. The doubts which have been expressed in relation to its durability and utility may be ascribed to its limited use and the want of scientific application; and these remarks, to a greater or less extent, will apply to all other concentrated manures. Much is yet to be learned, and additional experiments are requisite to settle our opinions respecting them.

Therefore your committee recommend a continuation of similar experiments during the next year, in the hope of a more propitious season and more reliable results.

All of which is respectfully submitted.

MARSHALL P. WILDER.
JOHN A. NASH.

* The oats were so injured by the drought that they were cut for fodder and considered worth about the same as English hay.

The Committee on Labor also presented the following

REPORT.

The Committee on Labor have given as much time and attention to the department committed to them as circumstances would permit.

It is a portion of farm operations of great importance, in an economical point of view, as well as to the care and influence over the boys when under the control of our men.

The rate of wages is necessarily high, in order to command men of ability and character, calculated to improve the moral sense of the boys, and to aid in carrying out the great object of the Trustees—their reformation.

The men working by the month have boarded at the Institution, as much to the annoyance and inconvenience of the Superintendent and his family as to our own. We have repeatedly been requested to provide some other place for them, and the Trustees have given notice that they cannot board them another season. We have no building at our command in which we can accommodate them. The convenience and economy of having the men board with the farmer is so apparent as to need no argument. It is for the Board to determine what measures they will take in relation to this matter. The labor employed on the farm is not only under the control of the farmer, but he contracts with laborers, and discharges them at his pleasure. We know little of them but through him. From the knowledge we have on the subject, we think the farmer has been anxious to obtain men who will do justice to the boys as well as perform their part in the field.

The number of men employed on the farm, exclusive of those employed on permanent improvements, has averaged seven and one-half for eight months from the first of April.

This included the gardener, who worked by the day, at one dollar and fifty cents, and the farmer.

The wages given were $16, $18, $20, and $22 per month and board.

Amount paid monthly hands, ...	$872	07
Mr. Doyle, as gardener, 160 days, at $1.50, . . .	240	00
Paid Institution for board of men, ...	602	43
Farmer's wages eight months, ...	433	33
Boys, average 42 a day, of 6 hours, at 10 cts., for 8 months,	874	10
	$3,021	93

Paid for labor of hired men, exclusively employed on permanent improvements,	$616 75
Total paid for labor on the farm,	$3,638 68

The labor on permanent improvements will, by the farmer's explanation, exceed the amount above stated, and reduce the amount chargeable to the farm, but not materially vary the result. The number of men and boys thought to be necessary for four months to come, to end the year, is four, two at $20 and two at $17 per month, and 20 boys daily.

Wages of men, exclusive of board,	$296 00
Board four months, at $3 per week,	208 00
Farmer's salary four months,	214 67
Twenty boys at 10 cents per day, for four months,	208 00
	$926 67
Add the amount for labor on farm before stated,	3,021 93
Total amount paid for labor on farm, exclusive of permanent improvement, is	$3,948 60

The income and other expenses your Committee have no knowledge of, and it must be obtained from the legitimate sources.

Respectfully submitted.

SETH SPRAGUE.
H. W. CLAPP.

December 1, 1854.

A committee was appointed, at this meeting, to confer with the owners of the lands contiguous to the State Farm, and to procure bonds from them for the sale of such lands to the Commonwealth, at any time on or before the first of April, 1855, and this committee was requested to report at the next meeting.

At the annual meeting of the Board of Agriculture, held at the State House, on the third, fourth and fifth of January, Governor Washburn was present, and presided until he was called away to attend to his duties at the Council Chamber.

Before leaving the chair, he remarked that, as it was probably the last time he should have the honor to meet with them, he wished to say a single word at parting. He should be doing injustice to them individually, as well as to the cause in which they were engaged, if he forebore to express to them the high personal regard which his intercourse with them had so much strengthened, and the interest he felt in the success of their efforts to promote the agriculture of the Commonwealth.

It had been a source of profound satisfaction to him that he had been permitted to take a humble part with them in urging forward the work in which they were engaged. And he counted it by no means the least of the honors or pleasures connected with the place which gave him the privilege of meeting and acting with them, that it had brought him into so intimate relation with gentlemen who constituted that Board, and to know by personal observation their devotion to the purposes for which the Board was created.

He was happy to believe that the interests of agriculture were assuming that importance in the public mind which their extent and magnitude demanded. Its position among the other callings and pursuits of our citizens was becoming better understood and appreciated in the Commonwealth than it had hitherto been.

Not a little of this was owing to the character and influence of the members of this Board, and men like them, who had brought to it character, intelligence and practical experience.

The need of some measure to elevate agriculture, and promote its success in the Commonwealth, had long been felt. How it could be best done, had long been a desideratum in the policy of the government.

The plan which had now been adopted seemed to him, in the present state of science and public sentiment, the best, and perhaps the only one that could be devised. It brought to the subject the combined knowledge and experience of gentlemen from different parts of the Commonwealth, who, by free conferences with each other, were able to test theories, and elicit what the public want to know—the truth of these, as determined by accurate experiment and sound observation.

It provided, too, for a body of men whose interests were the same with those of every farmer in the Commonwealth, and whose judgment and accuracy could not be impeached by suspicion of improper bias or self-interest.,

He could not but congratulate them that they had been made the honored instruments in carrying out so interesting and important an experiment. He doubted not they would continue to pursue the objects for which they had been appointed, and that they would find their reward in a proper appreciation of their services by a generous and confiding community.

In taking leave of his associates at that Board, over whose deliberations he had been permitted to preside for a brief period, he again assured them of his sentiments of high personal respect, of his best wishes for their success in every pursuit of life, and for their long-continued happiness and prosperity.

He thereupon left the chair, and took leave of the Board.

It was hereupon voted, that the thanks of the Board be presented to His Excellency Governor Washburn for the prompt and efficient manner in which he has attended and presided at its meetings, and that the Secretary be requested to transmit to him a copy of this vote, and request of him a copy of his remarks, to be entered upon the records, and to be printed.

The committee instructed to confer with the owners of lands adjoining the State Farm at Westborough, and procure bonds from them for the sale of such as are needed by the Commonwealth, presented their report through Mr. Lewis, the Chairman, that they had attended to the duty assigned them, and procured bonds running to the first of April, and amounting in the aggregate to the sum of $19,340.

At this meeting it was voted, that a committee be appointed to petition the Legislature to grant an appropriation sufficient to purchase the additional lands, as recommended by the Committee on Improvements, and which the interests of the State, and the increased wants of the State Reform School, require.

Messrs. French, Lewis and Brooks, were appointed as this committee. Voted, also, that the same committee be instructed to ask for an appropriation of six thousand dollars, for the purpose of permanent improvements on the farm, and for agricultural experiments.

The subject of the most judicious management of the farm was now taken up and discussed; and, on motion, it was voted to appoint a superintending committee of eight to manage the farm. This committee was appointed, consisting of Messrs. Wilder, French, Brooks, Newell, Sprague, Clapp, Nash and Chandler.

A committee was appointed, consisting of Messrs. Brown and Lewis, to consider what action should be taken with reference to the methods of awarding premiums by the societies. This committee reported that some evils had arisen from the practice which had grown up in some parts of the Commonwealth, by which individuals claimed and received several premiums on the same article from different societies, and that it was expedient to petition the Legislature to pass a law by which this practice should be prohibited.

In the preceding pages, I have laid before the Legislature the principal doings of the Board for the past year. Much time has been spent in the discussion and arrangement of minute details, which called for instant attention, and in the investigation, by means of committees, of various subjects in relation to which information seemed to be needed. These could not well be imbodied in a general report; but their results will, for the most part, be found in the account of the management of the State Farm already given, and in the reports of the various committees to which different subjects were referred.

One great and important object, for which the friends of agricultural improvement are now laboring, is to find means of anticipating and guarding against the evils of a disastrous season like that which has just passed. From the nature of his occupation, the farmer, like the sailor, must direct his course somewhat by his judgment of the future. Indeed, so many of the daily operations of the farm are dependent on the state of the weather that he is of necessity a meteorologist; and, from his constant habit of observation, he often becomes more skilful and more weather-wise than the scientific observer with all the aids of science. Meteorology promises some happy results for agriculture hereafter; but at present, investigators in this department of natural science must be rather the historians of the past than prophets of the future. As meteorological observations are continued, however, from year to year, with the aid of the vast facilities which science has given us, data will probably be obtained, from which we may predict, with some degree of certainty, the character of the coming season.

The climate of New England has never been sufficiently studied by agriculturists. The almanac is the only work on meteorology found on the shelf of the farmer. In this he now and then notes down the state of the weather, but he rarely attempts to keep accurate records of it from year to year, from which some reliable general principles might be deduced. So little attention has been paid to the difference between our climate and that of England, whence most of our agricultural precepts have been derived, that much unjust prejudice has at times prevailed against scientific agriculture, or what has been termed "book farming," when, in fact, an unexpected result has frequently been owing to this very difference. I shall take occasion to allude to this subject hereafter. For the present, I propose to state some of the characteristics of our own climate, and to give the results of some investigations to which I was led by the long-protracted and disastrous drought of the past year.

Scarcely had the summer opened upon us when complaints began to be heard in all parts of the country of the terrible effects of a drought almost without a parallel in the annals of agriculture.

To one wholly unacquainted with our climate, with its extreme alternations of heat and cold, it would be difficult to describe the effects of our droughts, or to give an idea of the gloom which they cast over the face of nature. The heavens over our heads are literally as brass. A look of despair takes the place of the green, smiling aspect of spring. The pastures are dried up, the leaves are scorched, and the flowers wither; even the golden corn, the pride of New England, which so generally luxuriates in the fierceness of our summer sun, curls and sometimes withers beyond recovery. Meantime, the power of the cloudless sun is intense. The panting animals in our fields vainly seek some shelter against the intolerable heat; the springs die; the lakes and ponds sink in their beds, or become infected; the living stream shrinks to a thread-like rill; and the very fishes die for want of water. There is no rain by day, no dew by night; for the refreshing vapor, we have but the choking dust, which floats in the air till respiration even is impeded, or falls on the parched and juiceless herbage, to rise an impalpable powder at every step. And still day after day the cloudless sun looks down upon the fainting earth, as if to draw from it all strength for the present, all hope for the future.

And while the fields are thus destroyed by the burning heat, fires run through the forests with frightful and irresistible rapidity, destroying the growth of centuries, and sweeping away every thing in their course, till only the blackness of ashes marks the site of bridges, houses and mills, and the hopes of the farmer seem to be utterly prostrated. This is but a feeble and inadequate picture of the suffering and despair which attend a long-protracted New England drought.

But the immediate ill effects of a long drought are not its only evil consequences. It is too often followed by a distressing scarcity of hay, and materially raises the prices of all provisions for the consumption of man, thus bringing great suffering upon all not prepared to meet a long-continued drain upon their resources.

But while, in many instances, the complaints and apprehensions of a failure of the harvest are real and well founded, it often happens that a panic is created for the purpose of effecting the prices of produce, or making a sale of large stores of grain. The facilities for spreading such an alarm are great, and there are always enough who are ready to use them. It seems, therefore, peculiarly appropriate, at this time, to inquire into the cause, the frequency and the severity of droughts, in the past history of the agriculture of New England, that we may see with what regularity the harvest follows the seedtime in the fulfilment of the promise that they shall never fail, and may appreciate fully the importance and necessity of guarding against these seasons of suffering.

The difficulties of such an investigation cannot easily be estimated by those who have never attempted it. No accurate meteorological records were kept till within a comparatively recent period. The thermometer was not invented till the year 1590, thirty years before the settlement of New England, and was not brought to any degree of perfection till the year 1700; and we cannot rely upon the accuracy of observations made by it previous to 1750. But few meteorological journals were ever kept in this State till within the last century. In order, therefore, to bring together all the information of value and interest on the subject, many old manuscript diaries must be found, and carefully read from beginning to end, and compared with each other. The information obtained in this way, though it cannot be regarded as scientifically exact, will yet be found to be sufficiently accurate for the purposes of this investigation. It will also give us a clear idea of some of the trials to which the early cultivators of the soil of New England were subjected.

The climate of New England is well known to be far drier than that of England. The first settlers had some experience of this, as early as 1623 when a drought commenced whose severity was well nigh destructive to the hopes and plans of the infant colony. The drought lasted from the third week in May till the middle of July. Little rain fell for six weeks, and the weather all the while was exceedingly hot. The corn, planted, as usual, with fish in the hill, began to wither, and the high lands all parched up.* After this it is probable that what would now be called a severe drought did not occur for several years. The dense forests that covered nearly the whole country, the only openings being a few clearings made by the Indians for cultivation, must naturally have afforded some protection against the intense heat which we often feel. The hardest trials of the early English settlers appeared in another shape, and it is not till 1630 that we find it noticed that "the summer is a good deal hotter than in Old England," and from the fact that, in 1634, it is recorded that "the summer is hotter than many before," we may infer that no great suffering had occurred from droughts up to that time.

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* The fish used were alewives, at that time called "shads."

"According to the manner of the Indians, we manured our ground with herrings, or rather shads, which we have in great abundance and take with great ease at our doors." "You may see in one township a hundred acres together, set with these fish, every acre taking a thousand of them; and an acre thus dressed will produce and yield so much corn as three acres without fish."—*Chronicles of the Pilgrims.*

Several of the preceding summers, on the contrary, had been exceedingly wet and cold, like that of 1632, causing "great store of mosquitoes and rattlesnakes," while the worms made extensive ravages on the corn.

The next drought of any severity was that in 1639, when little or no rain fell from the 26th of April till the 10th of June. There was a very general alarm. "The corn began to wither, and great fear there was it would all be lost." A fast being appointed on account of the drought, "the very day after there fell a good shower." The other years in which droughts occurred, previous to 1650, were 1644, 1647, and 1648; that of 1647 causing great scarcity of provisions. But during this time, more than one winter was remarkable for its severity. In 1641–2, "Boston Bay was a bridge of ice as far as the eye could see, and the Indians asserted that such a winter had not been known in forty years." Men, oxen, horses and carts passed over the ice with perfect safety for five weeks together; and in the spring of 1642, the price of cows, which had been as high as £22, suddenly fell to £6, £7, and £8. The winters of 1630, 1632, and 1639, also, are mentioned as very sharp and "terrible cold;" but it is probable that they were so only as contrasted with those of England, or on account of want of sufficient protection against their rigor. In 1645, the winter was said to be "the earliest and sharpest since we arrived in the country," while 1646 and 1649 were caterpillar years.

In the next ten years no considerable drought occurred. But the severe winter of 1654 is worthy of notice, as it has some relation to what follows. As early as the 16th of December, the cold was of sufficient intensity to freeze over Boston Bay, so "that in a very few days it was firm to pass betwixt the town and Long Island, and so continued above a month." The harbor was again frozen over in 1659. The canker worms, in 1658, 1659, 1660, and 1661, made great havoc with the apples in Boston and vicinity, and the trees looked in June as if it were November. In 1658, the caterpillars, also, did great harm to fruit trees.

Then came in 1662, early in the season, a very great drought, "insomuch that the grass and corn were so scorched there was little likelihood of any harvest." This continued till the 12th of June.

Most farmers have the impression that there was little difficulty in raising good crops of wheat in the early periods of New England; but from the testimony of many old diaries, it is evident that it was always an uncertain crop. In 1663, early in July, "the best wheat (as also some other grain) was blasted in many places, so that whole acres were not worth reaping. We have had much drought the last summer, (1662,) and excess of wet several other springs, but this of blasting is the first so general and remarkable that I yet heard of in New England." But this blasting is not unfrequently mentioned afterwards; for the very next year (1664) the wheat was very generally blasted, "and in sundry towns scarce any left," while the latter part of the summer was very droughty, much of the grass being scorched up. The blast returned again in 1665 and 1666 with great severity.

The next dry summer was in 1666, when most of the grain was scorched up, and the Indian corn eaten by the worms. The spring of 1669 was so dry that "the ground in some places began to chop." This was followed in 1670 by another dry summer.

June 14, 1672, was kept as a day of humiliation in all the churches because of a great drought; "and the Lord heard prayer, and in hay time much hay was lost by an overmuch rain." In the following year, (1673,) the months of March and April being very cold, many cattle died in all parts of the country for want of hay.

In 1675, there was some complaint of want of rain; and in 1681, "in June, July and August, was a great drought throughout the country, to the great loss in corn and grasses, valued at many thousand pounds."

The summer of 1685 was also dry, though not enough to do any great injury to the crops. In August, 1686, Increase Mather writes, "A great drought; swamps on fire in many parts of the country; could not be quenched. The fire burnt under ground in some places six feet." It began early in summer, and continued through June, and till the 18th of July, after which it appeared again. The drought was called "great and terrible." There were also severe droughts in July, 1692, and in July and part of August, 1693. The cold winter of 1697, resembling that of 1641, preceded a summer marked by "a sore and long-continued drought" in July and August.

Thus we have passed over a period of eighty years of the seventeenth century. The years remarkable for droughts were 1623, 1639, 1644, 1647, 1662, 1664, 1666, 1669, 1670, 1672, 1681, 1686, 1692, 1693, and 1697, in all fifteen, though a few other seasons, like 1648, were marked by dry weather. This is a smaller proportion than will be found in subsequent years, and the difference may be explained by the fact that the settlers at first had no means of observing accurately, and it is possible that there were more droughts than we have any record of, and that, on account of the small portion of the country under cultivation, comparatively little harm arose from an ordinary drought, especially as the settlers relied very much upon the salt marshes and the wet meadows for hay.

In 1704, there was a slight drought. In June, 1705, it was so dry that "corn and grass perished pretty much;" and in 1707, "water was not to be had for man or beast without great difficulty." In the year 1714, there was a drought of unusual severity. The distinct recollection of it survived many years after. In 1748, we find it referred to as the Great Drought, with which the one of that year is to be compared; and it is known that the following spring, 1715, was one of very great suffering, on account of the scarcity of provisions.

From 1720 to the present time we have somewhat more reliable statistics in the diary of the Rev. Thomas Smith, of Portland, the journals of Dr. Holyoke and Dr. Prince, of Salem, Professor Farrar, of Cambridge, and many other sources. From Smith we learn that, in 1722, there was in July "an exceeding dry time as ever was." In 1724, he says, July 23, "Great drought; every thing burnt up." This drought continued a long time, and was very general in the vicinity of Boston.

The spring of 1726 was wet and backward, so much so that the peach and apple trees did not begin to blossom at Portland till the 20th of May. Then followed a drought in June, causing a short crop of hay and great distress. In 1727 came another severe drought. The hay crop was again cut short, and many cattle died from starvation during the following winter. The spring and summer of 1728 were also very dry, especially in the month of June, when there began to be great suffering for want of rain. Here we have three years in succession in which droughts occurred. In 1730, July 7, "The drought came on very severely, and prevailed in such a manner as was never known." November 5.—"There is, I think, more grass now than in the summer."

The year 1737 was marked by its excessive dryness. Smith says, April 21, "All the talk is, no corn, no hay, and there is not a peck of potatoes to eat in all the eastern country." April 25.—"No grass at all." May 17.—"The grass don't grow, for want of rain; hay very scarce." October 23.—"It was never known to be so dry; no sawing nor grinding." November 24.—"No grinding; we have had a bag of corn go from mill to mill for about two months, and not ground yet." During the summer of this year there was great scarcity of corn, and many went about begging their neighbors to sell them a quart at any price, to keep them from starvation. In 1738, too, there was a drought in some sections of the country, "in such a manner as the like was never known."

The following spring (1739) was also very dry; there was scarcely any rain for a month. Here we find another series of three years of drought.

In 1743 there were "millions of devouring worms in armies, threatening to cut off every green thing. Hay very scarce, £7 and £8 a load." In the fall there was no rain for many weeks, so that, in November, the mills were stopped.

June 26, 1746.—"It comes on a very dry time." July 9.—"A melancholy drought advances." 31.—"The ground is exceeding dry." August 15.—"It is thought the present is the greatest drought that ever was in New England." August 24.—"Plentiful showers."

This drought cut off, to a great extent, both the corn and the grass, and greatly increased the price of both. Corn rose from ten to twenty-six shillings a bushel; and in November of this year, hay sold in Boston at £20 a load. During the autumn of the next year (1747) there was no water in the streams for grinding, on account of the dry weather; and in 1748, (to show another series of droughts,) all accounts concur in saying that the drought was unparalleled in the history of the country, except when George I. was crowned, in 1714. On May 15, Smith says, "Unusually hot, dry weather." 31.—"Melancholy time; all the talk is about the heat and drought; never the like." June 20.—"No rain except showers in the country this year." July 10.—"Dying hot. It is a most melancholy dry time; the grass in the pastures is all burnt up." 19.—"Steady rain." The English grass and the grain were cut short, though the Indian corn stood it very well. Fires raged in many places, and swept over many hundred acres. The farmers long remembered the drought of 1748; and, from all accounts, it seems never to have been equalled previous to that time. Men were obliged, in many instances, to kill their cattle for want of food. One farmer, who owned twenty cows, was compelled to kill eleven, and many were wintered entirely on rag-weed. The suffering during the winter was intense; and scarcely had the spring opened when (April, 1749) an awful drought commenced, and drove the farmers almost to despair. Cattle were every where suffering for want of food, and were driven to browse in the woods, while many farmers went from forty to sixty miles into the woods to cut meadows. This continued through May and June. The Indian corn was seriously injured, but a rain on the 6th of July revived it. And while the drought threatened to destroy every thing, the grasshoppers appeared in myriads, eating up whole acres of potatoes. Smith says, July 3, "I reckon my poultry (about a hundred) eat ten thousand grasshoppers every day." The inhabitants of Nahant formed a line, and drove them with bushes into the sea by millions. Meantime the heat was intense. It was said to be "the most remarkable time that ever we or our fathers saw;" and at Boston it was recorded, July 4, "Never more distressing time for pasture; only one-tenth of a crop of hay." 18.—"Extreme hot, dry weather, such as has not been known in the memory of man—so scorching that the creatures can but just live for the want of grass." 24.—"Thanksgiving for seasonable and refreshing rains." This summer was followed by so hard a winter in 1750 that it was difficult to keep cattle alive, and many were left to take care of themselves by browsing in the woods. Hay was imported from England.

Dry weather began again in July, 1752, and seems to have been severe and long continued; for Smith says, September 31, "Dry, dry, dry; melancholy drought." October 30.—"We wonderfully fail in our sauce, by reason of the drought." And Mr. Lane's diary, kept in New Hampshire, says, August 26, "A severe frost, which killed the corn and almost every green thing; there was scarcely any sound corn raised, and people were put to great difficulty for seed corn in the spring; and the spring following there was such a scarcity of provisions, both corn and meat, that it would make the hardest heart ache to hear the complaints of multitudes of people ready to perish for want of food, and begging for a handful of corn." In the summer it was imported and sold at forty-five shillings a bushel.

In 1754, Smith says, July 1, "I have no grass growing on my mowing ground, and there is no feed on the Neck; the reasons are, the open winter, three weeks' early drought, and the grasshoppers." 22.—"There is a melancholy drought." October 24.—"A great storm; the earth is filled with water." This was one century ago.

Three years after, in 1757, he says, June 1, "A very dry time; melancholy tidings of the drought from Boston and vicinity." 19.—"The drought awfully increases; the grain and grass are much cut short."

The next three years were wet and cold, but fruitful. The spring of 1758 was so backward that people did not generally begin to plant till the end of May, and the corn was spoiled by the dampness. "The corn being green, stunk in our chambers. Corn sold at £4 per bushel." And in 1760 it was said, on June 26, "There have been but twenty-four hours of hot weather this year." And yet all these years are spoken of as remarkably fruitful.

It is a fact familiar to every farmer, that a low temperature, evenly distributed over the spring and summer months, greatly favors the production of grasses, because most plants neither flower nor leaf out very abundantly without a large quantity of moisture. The grass grows with such rapidity, when well supplied with moisture, that in Lombardy, where irrigation is very general, they often cut four and five crops during the summer, and this, though there are four or five months when vegetation is at a stand. In our wet seasons it is not uncommon to get two or three crops, while in very dry years we may think ourselves fortunate if we can get one good one.

Smith says, in 1761, June 25, "It is as melancholy dry a time as I ever saw." July 5.—"As great a drought as in 1749." 7.—"Fast, on account of the distressing drought." 11.—"Gentle showers." August 1.—"The drought awfully continues." 12.—"No feed on the Neck a great while." 16.—"The drought increases." 19.—"Storm of rain."

The crop of hay was very much below the average, having suffered excessively from the drought, and the grain was still more injured. Corn could not be had the following winter, and many who were accustomed to use it were obliged to resort to biscuit and flour. And while the drought was burning up the grass and the crops, fires raged in the woods, destroying mills and bridges, and doing much other damage. The rain came on the 19th of August, and "remarkably renewed the face of the parched earth."

This year would doubtless have been long remembered and referred to, as one of the most distressing epochs in the history of farming, but for the terrible drought of the next year, (1762,) which exceeded every thing of the kind before known in the country. This drought deserves a passing notice.

The winter of 1761–2 had been long and dreary, and the snow, which began to fall as early as the third of December, constantly accumulated till it was more than five feet in depth on a level. In many places it had drifted until it was piled up in mountains. It was a time of deep distress for the poor every where. The drought of the previous summer had greatly diminished the supplies of hay, and farmers had depended on getting through the winter by browsing their cattle in the woods. This hope was now cut off by the deep snow. The poor, suffering, starving animals, cows, horses, sheep and swine, died one after another, as if the cup of distress were not full enough already. Hay sold at one hundred pounds a ton, and in many towns corn could not be bought, and it had to be dealt out little by little, with fear that it would not hold out through the winter. Passing from town to town was out of the question; indeed, there was no communication between different parts of the same town; and this difficulty continued far into the month of March. Some huge mountains of snow lingered even till the 28th of April. The spring, therefore, was very backward; and this added much to the sufferings of the people, already, it would seem, at their height.

At length a few vessels appeared in March, and people came down from the country towns "and lugged the corn up through the snow drifts, leading their horses." Corn sold at three pounds fifteen shillings a bushel, and rapidly rose to six pounds a bushel, even after the spring had opened.

All, rich and poor, were compelled to buy provisions. Nor did the distresses of this memorable year end here. The ploughing could not be done in season in the spring, partly on account of the loss of oxen and horses in the winter, partly from the want of hay, which made the few which were left almost unfit to work, and partly on account of the lateness of the spring, which crowded all the labors of the farm into a very short time.

When at last the corn was planted, millions of worms appeared to eat it up, and the ground must be planted again and again. Thus many fields were utterly ruined.

It was time now, in the month of May, for the drought to take its turn in the work of destruction, and it set in with terrible severity, even before there had been rain enough to settle the ground after the frost. The grass dried up almost as soon as it came out of the earth. In many instances people were obliged to mow what little they had in June; and they had so little that it sold for one hundred and twenty pounds a ton. The stalks of the Indian corn dried up, and it was thought it would die. Now fires raged with quenchless fury, spreading fear and dismay in their course, and destroying property to a vast amount. Fields were laid waste, barns and mills were swept away, and families were driven from their houses. In one town, no less than six houses and two sawmills, as well as several barns and many animals, were consumed, and in another six families were burned out. As early as the 5th of July there began to be fear of an absolute famine, on account of the "melancholy dry time." Smith says, July 7, "A fast, on occasion of the grievous drought. Fires continue." 22.—"Fires continue." 28.—"Famine feared." 30.—"A steady rain for several hours." But there was no very considerable rain till the 18th of August, when a plentiful rain remarkably renewed the face of nature.

The succeeding winter also was very trying. Our journalist describes it as being as "severe as any we have had;" he says that "people were reduced to the last and extremest distress;" that there was "scarce a bushel of corn in the whole eastern country;" that there were "deep snows and difficult travelling;" that "hay was scarce, and sold at one hundred and twenty pounds a ton." But although the following summer (1763) was very wet, so much so, indeed, that on the 1st of July we find the record, "No summer yet," and on the 14th, "Not a hot night this summer; indeed, no hot weather at all, but constantly wet," and on the 21st, "There have not been for two months past forty-eight hours of fair weather at one time;" and on the 9th of August, "Weather continues foggy and wet," yet we are told that every thing was "very plenty except money."

A very dry time occurred again in 1764, beginning early in August, and continuing through the month, and again in 1765, in April and August. The month of July, 1767, was exceedingly dry, and much alarm was felt. After this there was no "very melancholy dry time" till 1770; in July and August of that year came a drought of such severity that there was little prospect of corn. The worms had done much injury in the spring, and a "very uncommon sort of worm, called the canker worm, ate the corn and grass all as they went, above ground, which cut short the crops in many places." But rain fell on the 18th of August.

In 1772 we find complaints of the drought in the vicinity of Boston. In July the pastures were all dried up; there was but very little corn, and all kinds of grain suffered very much. July, 1773, was also very dry, and in 1774 there was little or no rain from the 7th of July to the 17th of August. The pastures looked like winter, and very little corn was harvested on account of the drought. This was in the neighborhood of Boston, but the suffering extended as far as Maine. Smith says, August 11, "A melancholy dry time." September 1.—"Very hot and dry." 16.—"An exceeding dry time." October 10.—"Every day is unusually warm, and constantly dry."

The next three years were years of plenty and prosperity; and it is a curious fact, that the springs of all of them were late and backward, and the winters of 1776 and 1777 were of marked severity, being among the coldest ever known. Smith says, May 15, 1777, "The coldest weather and the most backward spring that ever was." June 30.—"Cold, very cold; nothing like it through the whole spring; and yet every thing is flourishing except Indian corn." August 18.—"Never were there such gardens, never such fields, never such pastures, never such a year for every thing." September 2.—"The earth is burdened with its fruits."

A cold and backward spring is often followed by a fruitful summer. This is a fact familiar to every observer. In consequence of the hard frosts we frequently have in May, it often happens that fruit trees which have blossomed early are injured beyond recovery; while, on the other hand, if they have been retarded by a cold and wet spring, they come on very rapidly, and are as far advanced, on the whole, by the 10th of June, as they would have been if they had started earlier in spring. Thus, in 1824, the cherry trees blossomed on the 1st of May, and the peaches on the 4th; but a few days afterwards a cold snap came, which killed the shoots of all tender trees, so that the early warm weather was in the end really injurious to the growth of the year.

In 1778 the winter was unusually severe, but the spring was forward, and the weather fine, till July, when complaints began to be heard. July 2.—"It is a very dry time." 18.—"The drought awfully continues." 27.—"It is as grievous a drought as ever was known." 31.—"People fear a famine. The Indian corn curls, and is like to come to nothing; and there is no prospect of any potatoes, nor turnips, nor any sauce at all." August 6.—"Plentiful rains."

Droughts of a limited extent are noticed in the summer of 1781, 1782, and 1786, but in neither of these years was there much suffering from this cause; for, from 1779 to 1787, there was a succession of favorable seasons, and the various crops were remarkably abundant.

In the course of our examination, we are led to the conclusion, that a small amount of rain, evenly distributed over the season, will afford sufficient moisture for the support of vegetation; while, had the same amount fallen in a single shower, it would have done comparatively little good. Thus, in 1791, 2.30 inches of rain fell in April, 2.55 inches in May, 2.69 inches in June, and but 1.79 inches in July.* These amounts are below the average of those months, and would have led to a severe drought in July had not the distribution been very general over the month. To show the distribution of rain in July, for instance, when the smallest quantity fell, it may be stated, that it rained on the 30th of June, on the 8th, 12th, 14th, 16th, 17th, 20th, 21st, 22d, and 24th of July; though, as will be seen from the amount given above, no great quantity of rain could have fallen at any time. And again, in 1792, the rains for July were but 1.60 inches, and for August but 1.34 inches, but the distribution over these months was as follows: In July, it rained on the 9th, 10th, 16th, 17th, 21st, 24th, and 30th; and in August, on the 6th, 12th, 13th, 14th, 24th, 25th, 28th, and 30th; and we find, accordingly, no notice of any great difficulty from want of rain in that year. But had the same amount fallen on one day, and the other thirty days been clear, it is easy to see that vegetation must have suffered severely.

Soils, it is true, differ greatly in character, and some are far more liable to suffer from drought than others; but all soils depend more or less upon the amount of rain which falls, and its distribution over the seasons, for their fertility. The amount required differs of course with the nature of each soil, the temperature of the atmosphere, and its power to promote evaporation from the surface, and upon many other circumstances, which make all accurate investigations difficult and complicated.

The earth, with our climate, should retain at least three-hundredths of an inch of water to every inch in depth during the scorching suns of summer, and it should not retain more than nine-hundredths at any growing season. To maintain this proportion of moisture, it is of the utmost consequence to have a general and even distribution over the spring and summer months.

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* As appears by a record kept by Dr. Prince, of Salem, which is now deposited in the library of the Essex Institute.

It has been found, by accurate experiment, that the depth to which rain water penetrates in a clayey soil (composed of 43 parts of carbonate of lime, 33 parts alumina, and 20 parts sand) equals six times the depth of water fallen. A rain of .04 of an inch would penetrate .24 of an inch of soil; a rain of .5 inch would penetrate 3.0 inches of soil; and so on. This supposes the surface nearly dry when the rain falls. But suppose a rain to fall before the preceding rain has wholly evaporated, that is, before the earth is dry; the rain penetrates still deeper than before, increasing the depth of moisture. And these lower strata, when once saturated, retain their moisture of course longer than the surface, holding in reserve a fund of moisture for the roots of plants in times of drought.

During the winter months, or when the amount of evaporation is not equal to the quantity of rain, all soils which retain more than forty per cent. of water are wet. But when the amount of evaporation exceeds or doubles the quantity of rain, they dry up, and a drought succeeds. It is necessary, therefore, in order to know the severity of a drought, to study the distribution of rain over the seasons, and the amount of evaporation in the same seasons. The most serious droughts are usually those that come in early spring, and after them those that occur later in summer, during the ripening of grains. Dry springs injure the grass and grain crops; while an overabundance of rain sometimes causes the grain to blast, and the Indian corn to turn yellow. Moist climates, like that of England, are best for the grasses and root crops; and those in which such severe droughts occur, as in our own, require a very different system of husbandry.

It is evident, also, that the inclination of the soil must exercise a marked influence over the quantity of water which it would require to prevent its being two moist or too dry. Sands require more moisture than clays. This is so well understood in countries where irrigation is practised, that it is known to be sufficient to water stiff soils, which contain only twenty per cent. of sand, once in fifteen days in summer; if they contain forty per cent. of sand, they are watered every eight or ten days; if sixty per cent., every five days; if eighty per cent., every three days. From this it is plain that different soils require different quantities of rain to insure them from drought.

A drought of some severity is recorded in the year 1796, continuing for more than a month, in August and September. In the first of these months there were but two slight showers,* and not an entire cloudy day in the whole month. July also had been very dry. But little rain fell in June and July of the next year, (1797;) and but for its general distribution over the month, its small quantity would have occasioned much suffering. The amount in June was but 2.44 inches, and in July but 1.65 inches; yet it rained in July on the 8th, 9th, 14th, 23d, 25th, 27th, and 28th.

The next bad drought was in 1805. The latter part of the spring of that year was quite dry, and there was not an entire rainy day from the 16th of May to the 29th of September. In June there were slight showers on seven different days; in the whole month of July there was but one entire cloudy day, and but four light showers, while there were no less that twenty-two days on which not a cloud was to be seen. There were showers in August on eight different days, which afforded some relief, and more abundant rains set in on the 12th of September.

In August, 1808, there were but two light showers, and but one entire cloudy day. In June, 1815, also, there was much want of rain. In 1818, no rain fell, according to the Journal of Dr. Holyoke, from the 3d of August till the 7th of September; there was but one entire cloudy day during the whole month of August, and only a few days were even partially cloudy.

The spring of 1825 was forward, but the drought of April and May was exceedingly unfavorable to grass.

There were but two light showers in April, one of which was on the 1st, the other on the 29th, and but six cloudy days.

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* Dr. Holyoke's Journal.

The month of May followed with only four slight rains and seven whole cloudy days. In July vegetation suffered severely; there were but five light showers in the whole month, two of which were on the 1st, and only five cloudy days. It was oppressively hot at the same time, the thermometer, from the 10th to the 21st, ranging from 95° to 97° in the shade.* August was also exceedingly dry, there being but three rainy days. In this year there were sixty-four days in which the thermometer rose above 80°, twenty-eight of which were in July. There were fifteen days on which it rose above 90°. The drought was called very severe.

In 1826, the earlier part of the season was remarkably dry, and the springs were lower than in 1825. There was no rain in May till the 22d, and then but little.†

There were local droughts in August, 1828, when but .64 of an inch of rain fell at Waltham; June, 1832, August, 1836, July, 1837, and July, 1838.

The month of June, 1841, was very dry, only 1.17 in. of rain having fallen in Waltham, and 1.65 in. at Amherst, but no other general and excessive drought occurred till 1844. That year was almost without a parallel in the eastern parts of this State, and was marked by its excessive dryness throughout the country. The water in many of our streams was lower than it had been for years.‡ The quantity of rain during the three summer months was less than it had been for many years. As might have been anticipated, the crops suffered very much in many places.

A very dry time occurred in September and October of 1846, another in the spring of 1847, another in April, 1848, and another in 1853, when the quantity of rain which fell at Amherst was but .95 of an inch.

But the drought of 1854 was undoubtedly more extensive and more destructive than any of those which have preceded it. Not confined to this State, nor indeed to New England, it was felt in nearly every part of the Union. The loss from this cause alone has been estimated at no less than one hundred millions of dollars. From the 20th of June to the 25th of August rain fell only in slight showers and at long intervals, and in many localities there was none for two whole months. The melancholy effects cannot be described. Wells gave out that never failed before, ponds dried up, and streams diminished to nothing. The excessive rains of the early spring had retarded the usual operations of the farm; but with that exception, and after they had passed, the favorable character of the earlier part of summer had created a general expectation of an abundant harvest. But soon the earth was parched to perfect dryness; clouds of almost impalpable dust floated in the air, descending upon the wiry, juiceless grass, and covering the leaves of the trees, which began to fall to the ground, yellow and withered, in midsummer, and every plant seemed tried to the utmost limit of its endurance. Fires, too, ran through the forests and along the lines of our great railroads, burning over thousands of acres, and doing an almost incalculable amount of damage.

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* There fell at Waltham but 1.14 in. of rain, falling at Salem on the 1st, 4th, 6th, and 24th.

† Dr. Holyoke's Journal, Salem.

‡ But .57 inch of rain fell at Amherst in April of this year, and the whole amount at Waltham for the summer months was less than it had been for many years before.

Massachusetts, however, suffered less than most of the neighboring States. On the seaboard particularly, the crops looked pretty well in the midst of the drought, and in the deep soils of the valley of the Connecticut they withstood the heat remarkably well, considering its severity; so that, on the whole, the season has been much more fruitful with us than might have been anticipated at some periods of its continuance.

The drought of the last year was the more injurious on account of the large quantity of rain which fell in April, and the excessive wetness of the ground in consequence of it. The seed was sown late; and though some days of very favorable weather occurred, the drought coming on so soon, checked the growth of plants before they were well advanced. There was nearly twice as much rain in April, 1854, as in the corresponding month of any one of the preceding twenty years. The amount at Amherst was no less than 8.33 inches, while the largest quantity which fell there in any April during the last eighteen years was 4.82 inches, (in 1843,) and the average of the Aprils of the same years was but 3.27 inches. April, 1854, was, therefore, a remarkable month in this respect. If, now, we take the month of May, it appears that the amount of rain at Amherst, in 1854, was 3.19 inches. The highest amount for May at the same place, and during the same series of years, was in 1850, (8.72 inches,) while the average was 3.91 inches. Thus the rain for May was less than the average. The difference in June was still more marked. The amount for June, 1854, was but 1.75 inches. There were but two years in the eighteen in which June was so dry; they were 1841 and 1849, when 1.65 inches and 1.53 inches of rain fell. The greatest amount in June was in 1843, (5.18 inches,) while the average was only 3.22 inches. The rain for June, 1854, was, therefore, much below the average. The rains for April, May and June, are more important than those of any other months. It is also, as we have seen, a matter of the greatest consequence, to all who cultivate the earth, that these rains should be distributed with some degree of equality.

The change from a great excess of rain to an equally great suffering from the want of it also illustrates the fact familiar to the observation of every farmer, that one extreme generally follows another. In a long series of years or of months, we know that we are to have about so much rain in a given number of months; hence we may infer that, if an unusual quantity falls in one month, far less than the average is to be expected the next. In 1850, for instance, when there were 8.72 inches in May, we had in June only 2.88 inches; and in 1844, when only 0.57 inch fell in April, in May following there was the unusual amount of 5.59 inches. Instances might be multiplied indefinitely to illustrate this general law.

In July, 1854, 3.52 inches fell at Amherst, the mean average for eighteen years being 4.05 inches. During the same month 3.70 inches fell at Boston, and 2.16 inches at Waltham. But in August the amount was less than has been known in any one month for many years. At Waltham it was but 0.57 inch; at Cambridge but 0.35 inch, at Boston but 0.38 inch. These statistics will appear more distinctly by the aid of the following tables.

The amount of rain which fell at Amherst since 1837, as taken from the college record, furnished me by Professor Snell, is as follows:—

Rain and melted snow fallen in Amherst, in inches and hundredths.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1837, .	1.75	2.42	2.65	4.33	5.76	4.49	7.35	2.57	1.07	2.06	1.90	2.35	38.70
1838, .	2.45	1.67	1.69	2.02	3.63	4.90	2.27	3.95	6.38	4.12	5.77	0.96	39.81
1839, .	1.66	1.75	1.69	4.14	3.49	3.30	9.56	2.51	2.82	1.78	3.04	7.09	42.83
1840, .	3.15	2.03	3.18	3.98	1.91	4.60	3.34	6.82	5.20	5.04	4.60	3.16	47.01
1841, .	5.80	1.50	2.85	4.52	3.47	1.65	2.55	3.18	3.50	3.73	2.80	6.08	41.63
1842, .	1.02	3.78	2.39	2.92	2.40	3.18	1.95	7.42	3.23	2.84	3.73	3.19	38.05
1843, .	1.99	3.49	5.73	4.82	2.09	5.18	2.53	9.38	1.57	9.45	3.07	2.28	51.58
1844, .	3.44	2.18	4.12	0.57	5.59	3.00	3.81	4.93	1.84	6.49	2.12	2.49	40.58
1845, .	4.97	3.37	3.56	1.70	2.42	2.57	3.31	2.79	2.58	4.66	3.90	3.91	39.74
1846, .	2.74	2.55	4.35	1.54	4.33	3.10	3.25	2.44	0.47	2.09	4.96	3.10	34.92
1847, .	4.86	4.88	3.57	1.41	1.91	4.44	4.48	4.06	3.63	3.99	4.17	6.41	47.81
1848, .	2.92	2.60	3.03	1.55	6.18	2.58	4.72	1.53	2.49	3.75	3.09	5.54	39.98
1849, .	0.99	0.99	4.21	2.24	3.61	1.53	2.25	7.86	1.40	6.36	3.65	3.36	38.45
1850, .	4.75	3.56	1.86	3.93	8.72	2.88	6.81	6.50	4.93	3.65	2.63	5.37	55.59
1851, .	1.66	5.08	1.28	4.43	4.07	3.69	4.31	3.03	2.05	5.43	5.30	3.17	43.50
1852, .	2.41	3.35	3.26	4.71	2.29	2.54	3.38	5.19	2.47	1.76	6.43	4.88	42.68
1853, .	2.11	6.69	2.39	3.79	5.40	2.64	3.58	7.13	5.66	3.75	6.24	1.83	51.21
1854, .	2.01	4.53	3.10	8.33	3.19	1.75	3.52	0.99	5.46	2.30	7.48	2.39	45.05

From this it will be seen that the mean annual average is 43.84 inches. The largest amount of rain was in 1850, the smallest in 1846. The smallest quantity for the three summer months was in 1854, when there fell but 6.26 inches.

Table showing the amount of rain in inches and hundredths which fell in the summer months, at Waltham, since the year 1823.

YEAR.	June.	July.	August.	Total for Three Months.
1824, . . .	1.81	1.38	4.84	8.03
1825, . . .	5.07	1.14	5.95	12.16
1826, . . .	4.04	2.08	7.23	13.35
1827, . . .	2.14	2.71	5.59	10.44
1828, . . .	6.16	5.00	.64	11.80
1829, . . .	2.88	5.99	3.21	12.08
1830, . . .	4.01	6.09	4.54	14.64
1831, . . .	4.42	5.13	3.41	12.96
1832, . . .	.54	3.23	5.83	9.60
1833, . . .	3.97	3.38	1.33	8.68
1834, . . .	3.69	4.88	2.65	11.22
1835, . . .	2.16	8.63	3.47	14.26
1836, . . .	3.73	2.40	.97	7.10
1837, . . .	4.06	1.66	2.32	8.04
1838, . . .	5.09	1.86	4.74	11.69
1839, . . .	3.16	3.71	4.83	11.70
1840, . . .	2.41	2.09	5.22	9.72
1841, . . .	1.17	2.42	4.84	8.43
1842, . . .	5.90	2.20	4.70	12.80
1843, . . .	3.73	2.77	8.60	15.10
1844, . . .	1.26	2.44	2.85	6.55
1845, . . .	2.63	3.84	3.30	9.87
1846, . . .	2.44	2.38	2.18	7.00
1847, . . .	5.94	2.36	4.18	12.48
1848, . . .	3.10	1.92	2.28	7.30
1849, . . .	2.00	2.16	5.36	9.52
1850, . . .	3.72	3.48	9.64	16.84
1851, . . .	1.64	2.23	.99	4.86
1852, . . .	3.26	2.11	7.69	13.06
1853, . . .	.95	2.72	7.78	11.45
1854, . . .	1.87	2.16	.57	4.60
Total, 31 years,	98.95	96.55	131,73	327.33

Monthly average—June, 3.19 inches; July, 3.11 inches; August, 4.25 inches.

Average for the three summer months, 10.56 inches.

Average for 1854, 4.60 inches.

The largest quantity in the series was in 1850, 16.84 inches.

The average for the month of August is about 33 per cent. larger than for June and July.

Table showing the amount of rain and melted snow in inches and hundredths at North Attleboro', in 1853 *and* 1854, *as kept by Henry Rice, Esq.* :—

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1853, .	3.16	5.97	2.62	3.99	6.39	1.84	5.02	7.32	4.31	5.25	5.26	2.48	53.61
1854, .	3.41	5.26	2.91	6.72	3.70	2.32	2.15	0.55	6.16	3.15	9.09	4.55	49.97

Table of rain and melted snow in inches and hundredths which fell at Princeton, 1854, *as kept by Hon. John Brooks* :—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
2.31	5.73	3.16	7.74	5.35	3.14	3.38	0.22	5.07	2.65	8.10	4 27

At Cambridge, on an average of years, the greatest quantity of rain falls in December, and the least in April. In the eastern part of England, near London, the greatest quantity falls in October, and the least in March.*

These tables show conclusively that the drought of the past summer has not had its parallel for many years. Indeed, we have no reliable records of one which can be compared with it. Perhaps the famous drought of 1762 was equal to it; possibly that of 1749 was so; but we have no means of knowing with certainty.

But however this may be, it is highly desirable to ascertain its effects upon the staple articles of food, for on these all de-

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* *The average quantity of snow in inches and hundredths each month, for a term of years, at Amherst and Boston, is as follows* :—

Towns.	Jan.	Feb.	Mar.	April.	Dec.	Year.
Amherst, . . .	3.0	1.30	10.0	2.5	14.0	42.5
Boston, . . .	0.5	8.5	1.0	0.2	4.0	14.2

Total snow, 79.50 inches; rain and melted snow, 51.20.

pend. With the view of obtaining some accurate information on this subject, and of eliciting some valuable suggestions and useful facts in relation to others, the following circular was addressed to intelligent men in every town in the State:—

COMMONWEALTH OF MASSACHUSETTS.

Board of Agriculture, State House,
Boston, Sept. 15, 1854.

Dear Sir:—Will you be so kind as to favor me with answers to the following questions, together with such other suggestions as may be of general interest or value to the farmers of this Commonwealth?

If not in your power to give the desired information, you will do me a great service by interesting some one in your town who will procure and send it to me.

1. What has been the effect of the drought upon the Corn, Potato and other crops, the present season, and what is their estimated yield per acre?

2. What has been the comparative effect of the drought on deep and shallow ploughed lands?

3. What has been the comparative effect of the drought on lands where the manure was spread and ploughed in, and on those where it was put in the hill?

4. What has been the effect of the drought on forest trees?

5. What is the best mode of guarding against the effects of droughts like that of the present season?

6. Have there been any experiments in irrigation in your town? and if so, with what result?

7. To what extent has the disease affected the Potato the present season?

8. What is the estimated decrease in the quantity of Potatoes cultivated, and the decrease, per acre, on account of the disease or other causes?

9. What has been the result of experiments this season in the use of guano, superphosphate of lime, poudrette, or other concentrated manures?

10. To what extent is guano used in your town, and on what soils does it produce the best results?

11. Have you used guano several years in succession on the same soil? and if so, with what apparent result on the soil and crops?

12. What is the comparative cost or value, per ton, of the different kinds of manure used on the farm, and which produces the best return?

13. What is the best way of using swamp muck, and on what soils should it be used?

14. What is the worth of dry swamp muck, per cord, for agricultural purposes?

15. What is the average cost of raising and storing one acre of indian Corn, Rye, Wheat, Oats, or Barley, in your town, the average yield per acre, and the price per bushel?

16. How many pounds of Indian Meal are equivalent to one hundred pounds of good English Hay, as food for stock?

17. What is thought to be the value of Apples, either for flesh or milk, for stock, and the value of Cooked Apples for Swine?

18. To what extent have the ravages of worms affected the orchards this season?

19. What number of mowing machines have been used in your town, and with what success?

20. What is the cost of raising a Horse up to the age of three, four, or five years, and what is the average value at those ages?

22. What proportion of the farmers of your town derive their entire support from the farm?

23. Has the number of farmers in your town increased or decreased within the last ten years, and how much?

You will greatly oblige me by sending a reply before the first of November.

Very truly, your obedient servant,

CHARLES L. FLINT,

Secretary of the Board of Agriculture.

As this was my only means of procuring these important statistics, it was hoped that the farmers would cordially coöperate with me, and that the returns would be complete from nearly every town to which the circular was sent. It is but justice to say that my expectations have generally been answered. These returns, coming as they do from every section of the Commonwealth, imbody the opinions of the most intelligent portion of the agricultural community upon the most important interests of their occupation, and are second in value only to accurate official statistics. The returns will be found condensed, and arranged for convenience, in the form of a table, showing the estimated average yield and cost per acre of the staple products of Massachusetts, as follows:—

HARVEST OF 1854.

Counties.	Indian Corn.			Potatoes.			Oats.			Rye.			Barley.			Wheat.		
	Average per acre in bushels.	Estimated cost per acre.	Yield as compared with an average.	Bushels per acre.	Cost per acre.	Yield as compared with an average.	Bushels per acre.	Estimated av'ge. cost per acre.	Yield as compared with an average.	Bushels per acre.	Average estimat'd cost per acre.	Yield as compared with an average.	Bushels per acre.	Average estimat'd cost per acre.	Yield as compared with an average.	Bushels per acre.	Cost per acre.	Yield as compared with an average.
Essex, . .	30	21 00	one-fourth under.	100	-	average.	35	11 00	good average.	14	6 00	average.	28	11 00	one-fourth under	12	11 50	But little raised in the country.
Middlesex, .	30	23 00	one-third under.	100	-	good average.	25	9 00	one-fifth under.	15	10 00	nearly average.	15	9 50	one-third under.	18	10 50	little raised.
Worcester, .	33	19 00	from ¼ to ⅓ under.	120	-	good.	30	9 87	one-third under.	20	9 00	average.	25	8 50	average.	15	11 00	but little raised.
Hampshire, .	35	20 50	fair average.	125	-	average.	30	7 00	average.	15	7 50	average.	30	9 60	full average.	15	9 00	somewhat under.
Hampden, .	35	22 50	average.	150	-	average.	30	9 50	aver age.	12	7 00	somewhat under	20	11 00	somewhat under	-	-	- -
Franklin, .	35	17 00	average.	142	-	one-third under.	30	9 00	average.	15	8 50	average.	25	8 50	one-fifth under.	15	9 18	average.
Berkshire, .	35	18 00	one-fourth under.	122	-	one-fourth under	33	8 50	one-fourth under	18	8 62	slightly under.	23⅓	9 50	one-third under.	17	11 00	slightly under. In some sections a failure
Norfolk, .	40	30 00	one third under.	160	-	average.	30	14 00	average.	20	13 67	average.	15	13 00	somewhat under	-	-	none raised.
Bristol, . .	26	15 33	one-third under.	125	-	good average.	17½	7 00	one-third under.	9	7 00	one-third under.	15	6 50	one-fourth under	-	-	- -
Plymouth, .	30	17 7	one-fourth under.	100	-	average.	30	9 80	average.	10	8 40	somewhat under	20	13 50	average.	12	10 00	average.
Barnstable, .	22½	13 00	one third under.	80	-	one-half under.	22	6 00	one third under.	10	5 00	average.	18½	6 00	one-third under.	-	-	- -
Dukes, . .	33	15 00	average.	110	-	one-sixth under.	22	6 00	somewhat under	8	6 00	a little under.	15	7 00	average.	-	-	none raised.
Nantucket, .	20	-	good average.	200	-	more than av'ge.	23	-	few raised.	-	-	little raised.	-	-	none raised.	-	-	none raised.

This table is designed to show how much the crops have been injured by the drought in different sections of the State. It would have been more strictly accurate to give the returns as made from each town; but the great space which would have been required made it impossible, and they have accordingly been condensed, and given for the counties, by means of the average of all the towns in each county. This will be found to be a very near approximation to the truth.

It appears from this table, which has been very carefully prepared from the original returns made by the farmers themselves, that the estimated average yield of Indian corn for the whole State is thirty-one bushels per acre. Some counties suffered more than others; and the cost of raising per acre is of course greater in some counties than in others, according to the nature of the soil, the local prices for farm labor, and other local circumstances.

No crop, on the whole, withstands the drought so well as Indian corn. This plant possesses a wonderful flexibility of organization, which adapts it to a great variety of climate and soil. The yield the past year has been somewhat under the average; but, judging from the tone of the returns, it is of good quality. A farmer of Middlesex County says, "Corn is quite sound this year, and, with a little more rain in July, would have been uncommonly heavy, as we have had uncommon heat."

For the last three years, this crop has been more extensively cultivated than formerly, and it has now become the prime staple product of New England. Owing to some cause at present unknown, the disease which has attacked the potato for the last few years has not made its appearance the past year. This crop has therefore turned out better than for the last nine years, notwithstanding the fears which were entertained of its failure. But two or three instances of the disease appear in the returns. But for some cause or other, still unknown, the yield per acre, where not affected by the rot, is far less than it was in former years, when it was not uncommon to get from 300 to 400 bushels from a single acre. An experienced farmer of Middlesex County says, "For twenty years or more there has been a gradual decrease in the potato crop. Under the same treatment for some years past, I have been unable to obtain more than one-third the number of bushels from the acre I had in former years, admitting them all to be sound. The present year, my Long Reds, which were of good size, required twenty-four hills to fill a bushel basket. I formerly filled my bushel from eight hills, a little later from ten, then from twelve; and so on, up to the present time, gradually diminishing in yield." This has been the experience of most farmers, some ascribing it to the exhaustion of the soil, but most confessing an entire ignorance of the cause. Another farmer of Worcester County says, "The decrease is at least one-fourth within the last ten years, or since the disease commenced. The decrease per acre, arising from unknown causes, has been, within thirty years, more than one-half, saying nothing about the disease; i. e., one-half the potatoes in the hill."

There was probably a somewhat larger number of acres planted the past season throughout the State than for a few years past. This is alluded to by correspondents in different parts of the State. A practical farmer of Worcester County says, "Owing to there being a much larger area planted than usual, and no rot, it is believed that twice as many potatoes have been raised in this town and vicinity as in any year for the last ten years. The decrease, on account of the drought, I have already given as from 30 to 35 per cent. The quality of potatoes was never better."

From another part of the State an intelligent farmer writes as follows: "No complaint is made this year of diseased potatoes; in fact, they have not been so good and sound for many years as they are this season. The quantity of potatoes raised now is not more than half of what it formerly was. Then 250 or 300 bushels to the acre was not considered an uncommon crop; but now 150 bushels is called a good yield. The diminution in quantity may be attributed in a measure to the uncertainty of the crop, in consequence of the prevalence of the disease or blight." A farmer of Essex County writes as follows: "Probably there has been a decrease of nearly one-half in the number of acres planted with potatoes, and about the same decrease in the yield per acre. Formerly, before the rot made its appearance, our farmers used to manure highly, and the yield on good lands was about 200 bushels to the acre;

since then they have had an idea that manure increased the rot."

Although the trees of the forest had generally made their growth for the year before the drought commenced, yet our returns show that they suffered greatly from its effects; and here we have another proof of its severity. When a drought is prolonged, the leafy organs of all vegetables, not finding their usual nourishment, and losing many of their own juices by evaporation, must cease to carry on the processes of life with vigor; in extreme cases they wither and die, and their loss may even cause the death of the plant. In a very dry atmosphere, the evaporation from the leaves of trees sometimes has a similar effect. These effects, the falling of the leaves, and the check, to a considerable extent, of the growth of the tree, were observed on shallow soils in all parts of the State during the hot weather of the last season. One farmer of Worcester County says: "It has retarded their growth, and caused their foliage to fall prematurely. The mountain ash seems to have been more seriously affected than any other tree that I have noticed. The leaves were actually dead, and most of them fallen, by the first of September." So in Essex County, an observing farmer writes: "We feel confident that forest trees have suffered to a considerable extent by the drought. In some instances a whole acre looked as if a fire had passed over it. This is not common." In Middlesex County, "The trees on hills having a rocky substratum, had the appearance given to a forest where a fire had been in its near vicinity, but had not passed directly through it. The leaves turned early, not assuming the usual autumnal tints, but a dingy brown or chocolate color." Another says: "The drought appears to have been very injurious to the walnut in particular. Very many of these withered, and probably the coming season will tell a sorry account of the influence of the drought on trees." The results, except so far as they may be inferred from these extracts, cannot now be known.

I have already enumerated the most injurious droughts which have occurred in Massachusetts since its settlement, including that of the last year, and referred to the sufferings which arose from them. It remains now to speak of the cause of droughts, and the means of guarding against them.

There can be no doubt, as already intimated, that the destruction of our forests has much increased the severity of our summer droughts, and this effect may have been produced without any actual change in our mean annual temperature. All growing vegetables, and dense forests in particular, have a tendency to lower the temperature of the earth, by the large amount of evaporation which constantly takes place from their leaves, and by protecting the ground against the burning rays of the summer sun. It is a fact well known to every farmer, that deep snows lie much longer in thick forests than in the adjoining open plains. It is also well established by direct experiment, that the temperature of the soil, at the depth of twelve inches, in a forest, in the summer, is no less than ten degrees lower than at the same depth in an open field adjoining.

The forests, moreover, play a much more prominent part in producing rains than most persons, at first sight, would suppose. This is particularly the case when they stand on hills and elevated ground; in such situations their influence frequently extends to a considerable distance. The sources of rivers are found in them; they also determine the direction of the prevailing winds, and consequently the rains; hence the importance of protecting the forests which stand on land higher than the surrounding country.

These are, it is true, but general considerations; but as they explain, to some extent at least, the increase in the frequency and severity of droughts, which must be apparent from the sketch before given, I shall venture to extend them so far as to give place to the remarks of a late eminent French writer, whose statements show that the same causes have operated in the south of France, which is subject to droughts somewhat like our own. "The land," says he, "in most parts of France, stripped of the forests which once covered it, now presents a bare surface, which the clouds sweep over without finding any obstacles to arrest their progress and resolve them into rain. The soil, exposed to the rays of a scorching sun, is penetrated to a great depth, the sources of streams have dried up, and the rivers scarcely fill a third of their channels during the summer. Moreover, the winds, having no longer to blow over those immense forests, under the shade of which they were refreshed, and where they were impregnated during the dry weather with a warm moisture which they spread over the country, no longer bear with them freshness and life; forced, on the other hand, to blow over large extents of country parched by the sun, they become hot, and bear with them heat and sterility. Consider what North America was on the arrival of the Europeans. The soil, covered with dense forests throughout nearly its whole extent, offered to its occupants only frosts and snows for half the year; but the Europeans changed this state of things; the draining of stagnant waters, and, still more, the clearing of woods, which they effected soon after their settlement, were not long in diminishing the abundance of rains, and consequently drying the soil and rendering it warmer. Now, the Americans enjoy the advantages of their labor and industry; but let them take care not to pass the line of demarcation, which indicates the quantity of wood to be preserved, in order to have always the quantity of water necessary to the fertility of the soil; let them take care, especially, not to touch those grand forests, which, by their position, are in the way to arrest the clouds."

The grand old forests of Massachusetts have, unfortunately, long since been "touched;" and if they had not, the arm of the government even could hardly protect them from the hands of individual proprietors at the present prices of wood. The remedy for this evil would be, as the writer just quoted suggests, to form new plantations of wood in elevated places from which it has been cut, and to increase it in others where there seems not to be enough of it to produce the effect desired. In some locations, it would be a source of profit to the individual and the public to plant a large part of the poor soil with forest trees. It is, however, a well-established fact, that the forests of this State are at the present moment actually increasing in extent, though most of them are of a young growth.*

Professor Espy, whose Philosophy of Storms has given him a wide reputation as a meteorologist, suggests that droughts may be caused by the irregular burning of fallows or large tracts of wood or prairie land in summer, and that man, by his ignorance, may be the cause of them. "The summer rains at present are local, and of very limited extent; and though they travel towards the east, like winter storms, they are not extensive enough to cover the whole country in their progress; hence, portions of the country are liable to be parched with drought and hot weather. May it not be possible that this irregularity is in part produced by the irregular burning of fallows and prairies, thus producing partial and irregular rains, interrupting the wide-extended and general rains which would otherwise take place as they do in winter?"

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* A reference to my last Annual Report will show the manner of forming plantations of pines.

It is well known that the clouds which produce rain are composed of vapor, created by an evaporation from the surface of the earth, and from water, which takes place while the sun shines by day, and is, for the most part, suspended when the dew falls by night.

This vapor remains in the air until it is condensed into water by a low temperature of the atmosphere, and then ordinarily falls in rain. After it has thus fallen, the whole process of evaporation or creation of vapor, formation of clouds, and condensation of the vapor into water, must be again gone through with before there can be more rain. This, in summer, generally requires some time; hence, immediately after a rain in any given place, the air in that region is not likely to be in such a state as is favorable to the production of rain.

The winds greatly hasten the process of evaporation, while the clouds and the absence of the sun hinder or stop it altogether. An increase of temperature, also, usually causes a great increase of evaporation from the surface of the earth. In the proverbially moist climate of England, where the amount of evaporation must be far less than in our own, it is sometimes equal to six inches a month; that is, to an amount of vapor which, if condensed into water, would make six inches. In our climate, of course, it must be much greater.

If, now, from some local cause, there is a shower of rain, the moisture of the atmosphere, being collected and condensed, moves on in the form of clouds till these clouds no longer find sufficient vapor in the air to support them. If, just after this local rain, a general storm begins, or one which might, under other circumstances, have been general, it moves on till it arrives at the place of the former rain. But this previous rain has already exhausted the surplus of moisture which the air at that place contained, and the second storm must come to an end; whereas, if there had been no local rain in this first place, there would have been sufficient moisture to enable the general storm to continue on its course. On the other hand, if a general rain occurs, extending over a large space of country, and moving, as it does, from west to east, local rains cannot ordinarily take place within the same space for six or seven days, on account of the scarcity of vapor in the air.

Now, on these general laws, Professor Espy has founded a curious and ingenious theory for the production of artificial rains, which shall be general, extending all over the country in times of drought. These, of course, would render the practicable precautions which I shall have the honor to suggest of comparatively little importance. I will give his theory in his own words:—

"Now, if masses of timber, to the amount of forty acres for every twenty miles, were prepared and fired simultaneously every seven days in the summer, on the west of the United States, in a line of six or seven hundred miles long from north to south, then it appears highly probable from the theory, though not certain until the experiments are made, that a rain of great length, north and south, would commence on or near the line of fires; that this rain would travel towards the east, side foremost; that it would not break up until it reaches far into the Atlantic Ocean; that it would rain over the whole country east of the place of beginning; that it would rain only a few hours at any one place; that it would not rain again until the lower air becomes charged with vapor, and the upper air has radiated off the heat which it received during the rain, from the evolution of the latent caloric of the vapor, condensed in the formation of cloud, which effects could hardly be produced in less than a week; that it would rain enough, and not too much, in any one place; that it would not be attended with violent wind, either on land or on the Atlantic Ocean; that there would be no hail nor tornado at the time of the rain, nor intermediate; that there would be no destructive floods nor injuriously low waters; that there would be no oppressively hot nor injuriously cold weather; that the farmers and mariners would always know, in advance, when the rains would commence, or nearly so, and when they would terminate; that all epidemic diseases originating from floods and droughts would cease; that the proceeds of agriculture would be greatly increased, and the health and happiness of the citizens much promoted."

As it is not probable that an appropriation will be made sufficient to secure the success of the experiment, or that the inhabitants of Berkshire will burn over their mountains for the sake of watering the eastern parts of the State in dry weather, it will be necessary to confine our attention to somewhat more practicable methods of guarding against the effects of droughts. The importance of adopting them will be apparent to all.

The first and simplest is, to reclaim and cultivate low lands. The amount of swamp lands reclaimed every year in this State is sufficient evidence that both the practicability and the profit of this means are well appreciated. Eminent success has attended every experiment of the kind which has come under my observation; and the statements made to agricultural societies abundantly show that these lands, when properly treated, pay a large percentage of profit, larger, indeed, than any other part of the farm. No encouragement is needed to induce the intelligent farmer to engage in this enterprise. It tells its own story in redoubled crops. The methods of reclaiming are so well stated in the returns made to the Board every year that it would be unnecessary to dwell upon them here, even if it came within the range of this report. It is enough to say that some methods speedily repay all advances made on them, while others require a considerable expenditure, and make no return, or comparatively little, for two or three years. The compound interest which such improvements often pay at the end of that time should, perhaps, satisfy any reasonable expectation; but most men prefer to invest where they can get a speedy dividend.

A method which is found to be immediately profitable is stated on the forty-sixth page of the Agriculture of Massachusetts for 1853. It requires, first, one or more main open drains, if the swamp is large and very wet, to receive and carry off the water at once. A thin coating of stable manure is then spread upon the surface of the grass in spring, and on this potatoes are dropped. Small ditches are then made, five or six feet apart, the muck being thrown out upon the potatoes, to cover them. This leaves the whole in long beds, some five or six feet wide, on which the potatoes grow luxuriantly, no matter how tough the sod with which they are covered. In the autumn, when the potatoes are dug, the vines are thrown into the small trenches, the whole surface is again levelled off, and grass seed is sown. Some of the largest yields of grass ever known have been obtained in this way. The drought never troubles such land; while, on the other hand, no injury can happen in a wet season if the number of drains is sufficient in the beginning. A thin coating of gravel, hauled upon the grass in the fall or winter after it is sown, will be of great service. On this subject, I must refer the reader to the section on reclaimed land in the Report of last year.

Such lands can ordinarily be bought very low; and if they can be reclaimed at a trifling expense in the manner described, or in any other way, they will not fail to pay a very large profit, and that, too, year after year. They require less manure than the light uplands, and retain it longer. In fact, such swamps are generally natural muck beds, being composed of the vegetable growth of many ages, and are thus made up of the richest mould, often extending to the depth of many feet. This is the first and one of the most important practicable methods of preventing suffering from droughts, and one which is within the easy reach of nearly every farmer in Massachusetts.

The next mode is by irrigation. This is so dependent upon circumstances, however, that it is not practicable for all; yet many lands in this State are so situated as to make it not only judicious, but truly economical. It has never been attempted to any extent by the farmers of Massachusetts; but the few instances which have come under my observation have been successful and remunerative.

Irrigation has been practised by successful cultivators from the highest antiquity. Long before Europe was civilized, the waters of the Tigris and the Euphrates were used in this manner for agricultural purposes; and in Mesopotamia, between these two rivers, there were more than 250,000 acres of irrigated lands, not to mention similar works on the grandest scale in China, India, the Assyrian empire, Nineveh, Babylon, Egypt, Palestine, and many other countries of great antiquity. Modern nations have also profited largely by irrigation, particularly Lombardy, Tuscany, the south of France and Spain.

I am not prepared to say whether, under similar circumstances of soil and value of lands, equally good results might be anticipated here, where the climate is so different, and the value of lands, and of labor in particular, is so much greater. But every one is familiar with the fact that land is fertilized by extraordinary supplies of water. This is too palpable around the margins of every running stream to be denied; and while we are subject every summer to be visited by severe droughts, no practicable means of guarding against them should be neglected or overlooked.

The modes of irrigating are as different as the kinds of water used and the principles on which it acts. To attempt to state these modes, and the comparative advantages of each, would require a distinct treatise upon this subject. It is sufficient to enumerate the most common of them. Superficial irrigation was undoubtedly suggested by observing the wonderful effects which arise from the occasional overflow of rivers. The most remarkable example of this natural irrigation of arable lands is to be seen in the annual overflowing of the Nile; and the main principles which regulate this kind of irrigation are to be found in similar examples, where the overflowing is occasional, and the water, instead of being left to stagnate upon the surface, is moving gently over it, and depositing the alluvial matter held in suspension. The most wonderful cases of fertility on record are illustrations of the benefit of these occasional irrigations. The richness of the valley of the Mississippi and of the Connecticut is to be ascribed to this source; and these overflowings are imitated in all attempts to irrigate the surface by conducting water over it by means of a system of shallow open drains, which lead the water from its natural channel, and keep a constant flow, without allowing it to accumulate in any part.

Another kind of irrigation consists in conducting the water into, instead of upon, the land by means of open drains, into which the water can be led and raised sufficiently to saturate the whole area surrounded by the drain. If the field is level, it is sufficient to fill the drain or ditch, and keep it filled till the soil is moistened; but if the land is sloping, the lower end of the ditch is stopped till the land is saturated, and then let off. It is ordinarily much less expensive than surface irrigation, and has been practised with great success in Lombardy, as well as in England and Scotland. This kind of irrigation is more frequently used for cultivated annual crops than for grasses.

The irrigation of grass lands is found to be very beneficial in moist climates, and in such it greatly promotes the luxuriance of the growth. But climate undoubtedly greatly modifies the effects produced. It is the opinion of some that the grass which has been produced by irrigation is of an inferior quality. This opinion is expressed by several farmers, in answer to the sixth question of the circular, as to the results of experiments in irrigation. This opinion is also expressed by Columella, a celebrated Roman writer on agriculture. "Land," says he, "that is naturally rich, and is in good heart, does not need to have water set over it; and it is better hay which nature of its own accord produces in a juicy soil, than what water draws from a soil that is overflowed. This, however, is a necessary practice, when the poverty of the soil requires it; and a meadow may be formed either upon a stiff or light soil, though poor when water is set over it. Neither a low field with hollows, nor a field broken with steep rising ground, is proper; the first, because it retains too long the water collected in the hollows; the last, because it makes the water run too quickly over it. A field, however, that has a moderate descent may be irrigated if it be so situated as to admit of it; but the best situation is where the surface is smooth, and the descent so gentle as to prevent either showers or the rivers that overflow it remaining too long, and, on the other hand, to allow the water that runs over it quietly to glide off." But though not so nutritive as grass growing in the natural moisture, it is probably not so much less nutritive as many would suppose.

Stiff soils are generally sufficiently moist without irrigating, and light soils are more suited to this treatment. Sandy and gravelly soils, with a porous subsoil, are greatly benefited by it.

River water is most frequently used for these purposes, though spring water may be used to great advantage; and muddy streams, containing a large amount of animal or vegetable matter, are always eminently suitable for the purposes of irrigation.

But the value of irrigation does not depend solely upon the supplies of moisture which it furnishes. "The mechanical action of the irrigatory current of water, in exercising the plants, strengthening their organism, keeping their stems and root crowns clear of obstruction, promoting the equable circulation of water and oxygen around them, and causing an equable distribution of the soluble materials of their food, probably plays a considerable part in irrigatory fertilization. The differences of effect, from the mere circumstance of fluence or stagnation in the water, are prodigious; for while flowing water coaxes up the finest indigenous grasses of the climate, and renders them sweet and wholesome, and nutritious and luxuriant, stagnant water starves, deteriorates, or kills all the good grasses."

The process of surface irrigation is not so simple as many would suppose. It requires great skill and practice, and the farmer who attempts it without sufficient consideration is very apt to fail. In cases where it is thought to be practicable, it should be tried at first only as an experiment, and not on so large a scale as to involve great expense, unless there is a reasonable prospect of permanent advantage. With respect to its advantages, Sir John Sinclair says, "First, with the exception of warping, it is by far the easiest, cheapest, and most certain mode of improving poor land in particular, if it is of a dry and gravelly nature; second, land, when once improved by irrigation, is put into a state of perpetual fertility, without any occasion for manure, or trouble of weeding, or any other material expense; third, it becomes so productive as to yield the largest bulk of hay, besides abundance of the very best support for ewes and lambs in the spring, and for cows and other cattle in the autumn of every year; fourth, in favorable situations, it produces very early grass in the spring, when it is doubly valuable; and fifth, not only is the land thus rendered fertile, without any occasion for manure, but it produces food for animals, which is converted into manure, to be used on other lands—thus augmenting, in a compound proportion, that great source of fertility."

The use of the hydraulic ram in raising water for irrigation will hereafter be better understood and appreciated. By means of this simple machine sufficient water may be raised to fertilize many acres, which are now comparatively worthless through a considerable portion of every dry summer.

I shall take occasion, farther on, to speak of the difference between the climate of England and our own; and the reader will be able to judge for himself how far the difference in circumstances would be likely to modify the advantages derived from irrigation in other countries. It may be stated, however, that the south of France and Spain are subject to severe droughts like our own, and that irrigation is there resorted to as a remedy against them with great success, and with the most satisfactory results.

I have dwelt at some length upon this subject, because so little attention has been paid to it that its advantages are either not understood or not acknowledged. Further experiments are needed to settle the question as to how far irrigation may be practised here with profit. In point of natural facilities for obtaining suitable water, many parts of Massachusetts are eminently fortunate; and the time will undoubtedly come when the waters of our streams will be regarded as of inestimable value for agricultural purposes.

Another mode of avoiding the bad effects of our droughts is by deep ploughing and frequent stirring of the soil in dry weather. This will probably be found the most efficient and practicable mode to be pursued in upland cultivation. Deep ploughing and frequent stirring of the soil, is the answer made, in nine cases out of ten, to the question as to what is the best mode of guarding against the drought. "Spreading and ploughing in manure, hoeing often, exterminating every variety of weeds, irrigation where it is practicable, and keeping the ground light by deep ploughing on dry compact soils," says one. "For corn and potatoes, plough deep, and use the cultivator and hoe frequently, and keep the surface nearly level," says another. Another practical farmer answers, "Deep ploughing and good hoeing. Crops that have been hoed the most have stood the drought the best." Another successful farmer says, "Plant on swamp, or moist land well drained, if you have such; if not, *plough deep* on high land. If the uncultivated swamp and bog lands were cleared and appropriated to agricultural purposes, droughts like the one of the present season might not be feared. Massachusetts farmers have yet to learn that the most valuable lands are now neglected."

"I should say, first of all, deep and thorough ploughing, well manuring, by spreading and ploughing in, as a general rule, and frequently stirring the soil," says a Berkshire farmer of great experience. And the return of a farmer's club of Middlesex, says, in answer to the second question of the circular, "It is now a practice with us to plough deeper than heretofore. Mr. C. ploughs three or four inches deep. F. ploughs on precisely the same kind of land, a stone wall only separating the fields, nine inches deep. F.'s oats weighed thirty pounds per bushel, while C.'s weighed but seventeen pounds; both manured alike. C.'s corn dried up, while F.'s was green and luxuriant."

There is, indeed, but little difference of opinion on the second question of the circular, respecting the effect of droughts on deep and shallow ploughed lands, and few extracts need be given to establish the fact, that the crops on deeply ploughed lands have suffered much less than on shallow ploughed. One farmer of great observation in Essex County says: "The injury to shallow ploughed lands has been much greater than to those deeply ploughed, especially where the soil was well pulverized, as is done by the Michigan sod and subsoil plough; we look upon this as one of the most valuable implements in the field. No farmer should be without one. It will more than pay for itself the first season."

The same testimony is given by a farmer of Worcester

County in the following words: "My experience and observation are confined to light soils, plains, so called; and I find, whenever the ploughing has been increased in depth from year to year, with the view to improve the condition of the soil, the experiment has *always* proved successful. I have had a fine field of corn this year, on light soil, ploughed, as deep as I could well plough, with a double or Michigan plough."

From Berkshire we have the following: "It is, we are sure, an established fact, and one which must have fallen under the notice of every farmer, that deep ploughed and finely pulverized lands are less liable to the injuries of long continued droughts than lands ploughed shallow and left half tilled. The observations, not only of the last year, but of former years of excessive dryness, have shown this to be the case most conclusively. Reason teaches the same fact. The more open or porous any substance is the more readily it will absorb moisture."

A farmer of Plymouth County says, "Deep ploughing is favorable to retention of moisture in the soil, and shallow ploughed and scantily tilled fields are the first to suffer by droughts."

Another practical farmer in Worcester County writes, "The drought has affected *deep* ploughed lands but very little; on those that have been faithfully *subsoiled*, the corn leaves did not roll at all; while on those that were shallow ploughed, the crop suffered much; other crops have been seriously affected."

Another successful farmer says, "The effects of the drought on lands ploughed one foot deep are about the same as on those ploughed eight inches deep. Land ploughed five inches deep is more affected than that ploughed eight inches; so that less than eight inches is too shallow, and more than that of but little use."

Another farmer of Worcester County says, "Thorough ploughing, high manuring, and clean and frequent hoeing, and stirring the land so as to keep it light and free from weeds in all tillage land. On mowing land, spread compost and plaster freely; and on orcharding, plough among and dig around trees."

One more extract will suffice to show the general impression on this subject. An intelligent farmer of Bristol County says, "Plough deep, and thoroughly pulverize the soil, and in the after cultivation keep the soil well stirred with the hoe, cultivator, plough, or any other tool best adapted to the nature of the crop."

The returns received show most conclusively that the farmers of Massachusetts, in general, fully appreciate the importance of deep ploughing, notwithstanding the example set them by the societies in offering premiums for ploughing five, six and seven inches with single teams, and nine with double. Many of the writers also advise the gradual deepening of the soil, by ploughing a little deeper every year. The process is made thus gradual to avoid bringing up to the surface too much of the subsoil at one time, as, until it has been a year or two exposed to the air, this subsoil may have a deleterious effect on the crop. It may be said, in general, that deep ploughing is proper on all rich arable soils, and on all soils where the subsoil is as rich as the surface, or nearly so. In these cases, on most alluvial soils, the action of the Michigan or double mould-board plough has been greatly and justly admired.

But this is not the place to discuss the question as to what constitutes deep ploughing. The subject has been treated elsewhere, and by the ablest practical and scientific farmers. It may be said, however, in passing what is already well known, that the depth of ploughing depends much on the character of the soil, and that no judicious cultivator would plough to an equal depth in sand and clay. "Make heavy land lighter, and light land heavier," is a maxim the soundness of which has never been disputed.

There is also another practice which deserves notice in this connection. It was formerly the custom to put all the manure in the hill. Experience, however, which is always the best, though sometimes the dearest, teacher, led some to the conclusion that it was better to spread it and plough it in. The question proposed in the circular was, *What has been the comparative effect of the drought on lands where the manure was spread and ploughed in, and on those where it was put in the hill?*

Nearly every answer to this question has been in favor of spreading the manure. One practical and observing farmer of Berkshire says, "The crops on lands where the manure was ploughed in were much better than where it was put in the hill. On a field containing twelve acres, I spread over twenty ox cart loads of green barn-yard manure, and ploughed it under, covering the manure about five inches deep. On half of the field I used rotted yard manure in the hill, and on the other half ashes and plaster in the hill; and I judge the yield per acre, in favor of the ashes, is full one-third greater than where the manure was put in the hill. The same is true of other fields which I have noticed."

The same view was taken by a writer in Barnstable County, who says, "It is the general practice with us, when manure is used for the corn crop, to plough it in. One of our farmers, on a field of heavy land, ploughed in the manure on one-half of the field, and manured in the hill the remainder. We saw a difference in yield. Our conviction is decidedly averse to placing manure in the hill on dry soils; and, during the present season, manure on such soils has proved an injury."

The testimony on this subject is uniformly in favor of spreading and ploughing in the manure. I give a few more extracts. The first is from the statement of a farmer of Hampshire County: "On lands where the manure was ploughed in, not only on my own farm, but also on those within my knowledge, crops have been decidedly the best. On one field of corn I suffered much, in consequence of putting manure in the hill. One of my neighbors has for years ploughed his manure under, although reluctant to believe it best. I have finally come to the conclusion that to plough in manure is always preferable for a corn crop."

Another, in Plymouth County, writes as follows: "In years past, I was in the habit of putting my manure in the hill; but for two or three years past I have ploughed the most of it in, and put a small quantity of fine manure in the hill. I am sensible that I get better crops, and the land is less exhausted, and in a better state to produce a subsequent crop of grain or grass."

The practice of spreading a part of the manure, and putting a part in the hill, has proved successful in many cases; but where the object is to guard against drought, it is found best to spread and plough in the whole. Except in seasons like the past, however, many seeds will be benefited by some stimulus in the hill.

We have, then, these modes of avoiding or diminishing the effects of droughts like that of the past season. I. To pay more attention to the cultivation of low, swampy lands, first draining and thoroughly reclaiming them. II. To irrigate wherever it is practicable; and where this method is adopted, the land should always be carefully drained and properly prepared, so that the water may run off, otherwise it will grow stagnant and do much injury. III. To plough deep; spread and plough in the manure rather than put it in the hill; stir the ground very often with the hoe, cultivator, plough, or some other suitable implement; and IV., for trees and shrubs, to mulch with hay, straw, tan, &c., which, in the country, may be removed in winter, to prevent the attacks of mice upon the bark.

It may be well, however, to speak a little more at large upon the importance of stirring the soil often, as it cannot be denied that there is some difference of opinion in regard to it. All know that dew is formed much more freely on some surfaces than on others; and hard surfaces, like a beaten road or a gravel walk, gather far less dew than porous or grassy surfaces. Tufts of wool or hair, or the gossamer threads of the spider, collect moisture very readily; so does the grass; and so do all porous surfaces which have the power of readily giving off heat. Hence the importance of very frequent stirring of the surface, in times of drought, as we thus secure all possible good influence from the dew and moisture of the atmosphere.

But some may suppose that, as the soil is stirred and loosened, the evaporation will be greater, on account of the greater amount of surface exposed to the air. This is, to some extent, true. The evaporation from the surface of the earth, and from water, is rapid and constant during our hot summer days. The amount of moisture sent up from a soil which had just been saturated was found by careful experiment in France, in the month of August, and with the temperature ranging from 73° to 75° Fahr., to be as follows:—

Amount evaporated, in inches and hundredths, from the soil.

First Day.	Second Day.	Third Day.	Fourth Day.	Fifth Day.	Sixth Day.	Seventh Day.
.1614	.0984	.0708	.0511	.0511	.0472	.0511

The amount of evaporation from water, at the same time, was,

First Day.	Second Day.	Third Day.	Fourth Day.	Fifth Day.	Sixth Day.	Seventh Day.
.59	.53	.45	.47	.46	.43	.37

This shows how rapidly evaporation takes place from the surface after a rain, more than a fourth of the whole amount of moisture in the soil being raised the first day. As soon as the earth becomes dry, the evaporation is scarcely appreciable. At the end of the second day, at the temperature given above, the earth will generally have become dry to the depth of from .07 to .11 in.; and after eight days, plants which do not penetrate the soil more than four inches will begin to suffer from drought, and require watering. In the higher temperatures which we frequently have, evaporation is more rapid. But if a light rain falls on a hard surface, it cannot penetrate to any great depth; while, on a light and porous soil, it is absorbed at once, and will not evaporate so rapidly, since it is in some measure protected by the earth. So with dews. We have seen that on a hard surface there is no dew, or but little; and even if there were much, it would very soon evaporate; while on a mellow, porous surface, much more is deposited, for the reason intimated above, and it must remain longer in the soil. It is a curious fact, also, that the most thoroughly drained land stands the drought best. This is explained by the consideration that the roots of plants can shoot down to a greater depth in such land without finding substances injurious to them.

Now, our summer rains ordinarily come at considerable intervals, and are immediately followed by scorching suns or drying winds. Still more frequently they come in showers, followed by an atmosphere as clear and unclouded as any in the world. If the rain has penetrated through a light, porous soil, it may evaporate sooner than the same amount of moisture distributed through the same depth of a hard and impermeable surface; but we have seen that the same amount of rain does not penetrate the hard surface, or, if at all, only to a partial extent, and its evaporation consequently is as rapid as that from the porous surface, or even more so.

There can be no greater mistake than to fear to injure the crops by the evaporation gained by mellowing the soil. Plants never suffer so much as when the surface becomes a little hard and forms a thin crust, which cuts off all communication with the air. But when this crust is broken, and the earth is loosened, the dews reach the roots of plants, and are often sufficient to support vegetation a long time without rain. Let any one who doubts try the experiment, and he will be convinced of the advantage of deep ploughing and frequent loosening of the soil. I am the more anxious to recommend this practice of frequently stirring the surface of cultivated lands, because by means of the cultivator for the larger crops, like Indian corn and potatoes, and the onion weeder, that indispensable labor-saving machine for root crops, it may be done by every farmer with very little expense.

The question has frequently been raised, whether our climate has undergone any perceptible change within the last two hundred years, or since the settlement of the country. The subject was so well treated in a communication to the Board of Agriculture by the Hon. John C. Gray, and published in the Report of last year, that I shall only briefly allude to the present state of the question. Statistics give no good evidence of any material change; but nothing is more common than to hear the remark, that our winters are not so severe, or that we never have such severe storms, as formerly, while our summers every year become more oppressive; or, in other words, that the climate is warmer than it was. We can hardly believe that an impression which prevails so generally can be entirely without foundation. Besides this, we know that causes have long been in operation which tend to produce the effect in question. These causes have incidentally been alluded to above, and need not be dwelt upon here any further than to say, what has already been intimated, that dense forests must prevent the snow from melting and the moisture from evaporating within their limits, and thus lower the temperature of the atmosphere within them, making, as it were, a reservoir of cold air, from which a constant current will be poured upon the surrounding country. In the same way, they must protect the sources of our springs and running streams, so that their destruction must increase the liability to drought in the whole adjacent region. The last effect has probably been produced in the manner indicated, whatever may be our conclusion on the general question of climate; and I think most men can call to mind streams which are much smaller now than formerly, rivers that have dwindled almost to brooks, brooks that have become little rills, and rills that no longer exist. The same process is going on upon the continent of Europe, and many of the large rivers there have become perceptibly smaller, and probably from the same causes, since it is pretty conclusively shown that the amount of rain, so far from having diminished, has slightly increased since the year 1689, when the positive data as to the quantity of rain at Paris begin. The same slight increase has also probably taken place at Milan. Accurate observations were made on the Oder from 1778 to 1835, and on the Elbe from 1728 to 1836, which establish a very considerable progressive diminution of water, and from which it appears that, if the diminution continues in the same ratio as since 1781, it will be necessary, after 1860, to change the form of vessels used on the Elbe, and to construct those of less draught. The decrease there is ascribed to the causes specified above, and chiefly to the clearing up of forests, the draining of ponds and marshes, and the reclaiming of swamps.

We have seen that no accurate records were kept in the early history of the colony; indeed, that there were no means of keeping any till the middle of the last century. The diaries, both manuscript and published, which have been consulted, give some information on this subject, though it is more general and less to the point than could be desired. We learn from them that there were many winters when it was common to pass with men and teams to and from the islands in Boston Harbor, Shirley Point, and across the river to Charlestown. We find, too, that not unfrequently the snows were very deep and the roads impassable.. But all deductions from such vague accounts as those are unreliable, when compared with those drawn from careful registers of the weather.

On the other hand, we may infer that our climate has not greatly changed within the last hundred years, from an examination of the following table of the mean temperature of the summer months at Cambridge, near Boston, during the period from 1742 to 1774, and that of the same months, from 1793 to 1812, and from 1841 to 1852, inclusive:—

1742—1774.		1790—1812.		1841—1852.	
May,	58°.66	May,	56°.66	May,	54°.71
June,	67°.26	June,	67°.36	June,	65°.75
July,	72°.92	July,	72°.44	July,	71°.25
Aug.,	70°.91	Aug.,	70°.66	Aug.,	68°.68
Sept.,	62°.01	Sept.,	62°.43	Sept.,	61°.31

These figures show a most striking resemblance between the periods in question, and certainly give no color to the idea that our summers have become any warmer.

It is proper, in this connection, to notice very briefly the difference between the climate of England and our own. This subject also was so ably treated in the paper above referred to that it will not be necessary to dwell upon it at any length here. I desire only to show how little we can rely upon the results of experiments made in England, and how unsafe it would be for us to follow implicitly, in every case, the precepts of British agriculturists.

The climate of England is proverbially damp, with almost constant cloudiness and rain; hence the greenness and verdure of its fields, which are never parched up like our own. The soil of any country, of course, will be moist or dry according as its atmosphere is moist or dry. As the summer advances, and the heat increases, both will gradually lose their moisture; and the degree of dryness will be in some proportion to the intensity and long continuance of the heat. Hence, as the temperature never rises so high in England as with us, and never continues at its highest point there as here, the English farmer will never suffer from the droughts which oppress us.

The average number of days on which it rains in England during the year is no less than 178.1, giving a monthly average of nearly fifteen days. In other words, it rains in England, on an average, almost every other day. The following tables give the average number of days on which it rains near London for each of the several months during the ten years, 1807—1816, and during the period between 1817 and 1823:—

1807—1816.		1817—1823.	
January,	14.4	January,	16.3
February,	15.8	February,	14.3
March,	12.7	March,	16.7
April,	14.0	April,	15.7
May,	15.8	May,	14.6
June,	11.8	June,	11.9
July,	16.1	July,	13.0
August,	16.3	August,	12.6
September,	12.3	September,	13.0
October,	16.2	October,	16.1
November,	15.0	November,	16.0
December,	17.7=178.1	December,	15.4
		Average per month,	14.6

But the average number of days per month on which some rain or snow fell at Salem, near Boston, during the same years, (1807—1823,) was as follows, including even the slightest showers:—

1807—1816.				1817—1823.			
Jan.	9.5	July,	9.7	Jan.	8.6	July,	8.3
Feb.,	9.9	Aug.,	10.7	Feb.,	8.1	Aug.,	8.0
March,	9.6	Sept.,	7.6	March,	8.6	Sept.,	7.3
April,	8.2	Oct.,	8.2	April,	8.8	Oct.,	7.6
May,	11.8	Nov.,	9.6	May,	12.0	Nov.,	11.1
June,	10.8	Dec.,	9.0	June,	9.0	Dec.,	10.7

Or, to take a longer term of years, and, therefore, a more accurate standard of comparison, we have the average number of days on which some rain or snow fell at Salem, from 1786 to 1828, as follows:—

January,	10.1 days.	July,	8.8 days.
February,	9.5 "	August,	9.2 "
March,	9.7 "	September,	7.9 "
April,	9.2 "	October,	7.8 "

May,	11.0 days.	November,	9.0 days.
June,	9.5 “	December,	9.6 “

Total annual average, 111.3 days.

These observations include those days on which slight showers fell. It is hardly necessary to remark, that our showers of summer rarely come so slow and drizzling as the short rains in England. If we add up the parts of days on which it rained or snowed in the vicinity of Boston, including, of course, those days on which it rained or snowed all day, we find an average of but 58.8 days, the largest number in any year of the series of nineteen being 72 days, the smallest 45 days, and these days are distributed among the several months as follows:—

January,	6.4 days.	July,	4.1 days.
February,	6.5 “	August,	4.0 “
March,	5.4 “	September,	4.1 “
April,	4.9 “	October,	4.1 “
May,	5.3 “	November,	4.5 “
June,	3.8 “	December,	5.6 “

Or, to carry the comparison still farther, I take observations made in Berkshire County in 1837 and 1838, regarding them as average years, and find that the number of days on which it rained or snowed in these two years was 98½; or, leaving out the days on which it snowed, we find that in 1837 it rained 38½ days, and in 1838, 32½. In 1837 there were 157 fair and 157½ cloudy days; in 1838, 203 fair and 114 cloudy days. These, it should be noticed, were not excessively dry in that part of the State, but on the contrary, with the exception of great failures in wheat sown in competition for the State bounty, they were marked by agricultural prosperity. The amount of rain at Amherst, in the summer of those years, was,—

1837.		1838.	
April,	4.33 inches.	April,	2.02 inches.
May,	5.76 “	May,	3.63 “
June,	4.49 “	June,	4.90 “
July,	7.35 “	July,	2.27 “
August,	2.57 “	August,	3.95 “

These statistics show in the most striking light the characteristic difference in the climate of the two countries. The dry extreme, which never approaches the dry extreme of our climate, occurs in England but once in five years; the wet extreme once in ten years.

But we must not assume that more rain falls in England than in Massachusetts. The mean annual fall of rain near London for the period of 35 years, from 1797 to 1831, was 25.42 inches; while the mean annual amount for 12 years at Cambridge, Massachusetts, was 43.06 inches; at Boston, for 30 years, it was 42.43 inches; and at Amherst, for 17 years, 42 inches. Thus it appears most conclusively that we have far more rain during the year than falls in the eastern parts of England.

The mean temperature of England appears from observations made near London to be 48°.5 Fahr., the latitude being 51° 31′; while the mean temperature at Boston, latitude 42° 21′, is 48°.9. The mean annual temperature of the summer months in England is 61°.7; at Boston for the same months it is 69°.1. Thus the mean temperature of the two countries appears to be about the same, though the summer months present a very marked difference. But our climate is subject to sudden and marked changes, while that of England is comparatively equable. We have many days in winter when the thermometer falls far below zero, and in summer we frequently have it above 80°, or even 90°, for several days in succession; while in England it very seldom rises above 80° in summer without being followed very soon by thunder and rain, and very rarely falls as low as zero in winter.

The difference in the amount of evaporation of the two countries is a fair index of the difference in the climate of these countries. Evaporation will generally be found to be in proportion to the height of the temperature and the extent of water or land surface. Ordinarily, in temperate zones, it is about 37 inches a year, but in the tropics it amounts to from 90 to 100 inches. The atmosphere when at the freezing point contains about a two-hundredth part of its weight of water, while at 52° it contains about a one-hundreth part, at 74° a fiftieth part, at 98° a twenty-fifth part; and so on. The evaporation in our climate is of course vastly greater than in England, and simply because our summer heats are greater. And as the effects of evaporation upon the soil, and upon vegetable and animal growth, can evidently, in a great measure, be controlled by various operations on the farm, it follows that a system of agriculture which might be best adapted to one climate might be very ill suited to a climate where the atmospheric phenomena were so different.

This difference of climate becomes a matter of great practical importance when we take into view the influence which it must have on the animals which we import from England. Although there is no very great difference in the average annual temperature of the two countries, we have seen that the changes are far greater and more sudden with us; and both our summer heats and our extremely cold weather in winter are vastly more severe than any that is ever known in the south of England or in the Isle of Jersey. Moreover, our climate is very stimulating, and a constant strong stimulus, applied to an animal not accustomed to it, must greatly accelerate the action of the heart, and thus affect the whole system. The change acts so powerfully on the human system that the circulation is quickened to the extent of fifteen pulsations a minute over the usual number before being subject to this stimulus. Its effect must be as much more powerful and perceptible on the larger animals, as their arteries are larger than ours. A similar effect on cattle is familiar to drovers in some parts of our own country, and particularly to those who drive from Ohio, or from Kentucky, the climate of which is not very unlike that of England, to the New Orleans market. The loss from this cause became so serious as to excite the attention of physicians, and a paper was prepared by a distinguished scientific man, in which, after stating that a gradual and steady reduction of the animal energy should be produced, he says, "The quantity of food which the system will in ordinary circumstances require must be diminished, and all the common exciting causes of increased arterial action, such as the heat of the sun, quick motion of any kind, be avoided. Besides, those medicines, which have a tendency to diminish the heart's action, must not only on the first attack of the fever be resorted to, but should, we think, even in a state of health, from time to time be administered. Shade, a plentiful supply of water for the animal to stand in during the heat of the day, I conceive to be of all things the most essential."

It is well known that much disappointment has been experienced in importing Arabian horses into England, where they not unfrequently become wholly unfruitful, or give birth to a progeny far inferior to themselves. It is by no means improbable that a like effect will be produced on the sheep which have been carried from the north to the south of our own country within the last few years.

Animals should gradually be accustomed to a new climate, otherwise deterioration must inevitably follow. This was observed even by the earliest settlers of New England, and the cows raised from those first imported were very soon found to be smaller than their dams. If we consider for a moment the distinguishing characteristics of animals which have been accustomed to a warm climate, and compare them with those of the same variety after they have been long exposed to a colder one, we shall see still more clearly the importance of care and caution where the change is great. Animals bred in a warm climate will answer in the main to the following description: "Their skin is thin, supple and oily; their hair scanty and fine; their limbs long, the tendinous parts distinct; their horns hard, dry and brittle; the hoof contracted; the feet narrow and sound; the muscles dry, and but slightly fat; and their temperament rather sanguineous than lymphatic. The circulation of the blood becomes accelerated; they possess much ardor, energy and courage; while the several parts of their bodies seldom acquire very voluminous proportions." If we look, now, at the characteristics of the animals of a colder region, we find that they have "more strongly marked proportions; have their skin thicker, harder and drier; their hair longer, coarser, and more bushy; their extremities shorter, with the tendons less strongly pronounced; the horns softer and more spongy; the feet larger, broader, more flattened, and less compact; the muscles stronger, closer, and well supplied with fat. Their temperament is rather lymphatic than sanguineous, their circulation is slower, they possess less physical and mental energy, and may almost be said to consist wholly of matter, as they are visibly deficient in ardor, energy and courage."

The descriptions given above apply respectively to animals which live in very warm or very cold countries. Those brought from England, France, or the Isle of Jersey, to New England, do not find a climate entirely the reverse of their own, but there is difference enough to make the change in some degree injurious to them. Undoubtedly much may be done to facilitate acclimation, and prevent ill effects from the change, by care in providing suitable shelter in winter. It would be still better to import them while young, when, from the greater flexibility of organization at that age, they would more easily accommodate themselves to their new circumstances. Yet, with all the precaution and care which can be taken, it must still be somewhat doubtful whether the delicate organizations of the thoroughbred animals will be able to bear the extremes of the climate of New England without injury.

There is another point of view in which this difference of climate is worthy of consideration. I refer to the practice of draining, and the great importance now laid upon it by most theoretical writers on agriculture, guided very much in their deductions by the results of this practice in England. It will have been noticed by what has been said that more water falls here than in England; but it does not follow that our lands are wetter, for we have seen that, while England has an atmosphere eminently foggy, we have one eminently dry, or, at least, liable every year to cause the crops to suffer during the growing season for want of moisture. Evaporation here is very rapid, while there it is comparatively slow; and of course after a rain the soil is much longer in drying, and consequently a small amount of rain there may cause the soil to be wet and cold. No one can doubt the propriety as well as the profit of draining all wet and cold soils which it is designed to improve, and particularly all lands where there is an excess of water on the surface, all stiff, clayey soils, and loams in which clay predominates, and generally all springy soils. Draining and loosening the soil allows the air to penetrate into it, and to cause those chemical changes to take place which are necessary to prepare the nourishment of the plant and to promote its growth. But all plants require a certain amount of moisture, in order to enable them to arrive at their perfect development. Some soils have the ability to retain moisture enough to supply this want, and some retain an excess, even in times of drought. There is a constant evaporation or exhalation from the surface in dry weather, and when the surface becomes dry this exhalation arises from the lower strata, ascending through those above, and so passing off from the surface; and there can be no doubt that this upward movement of moisture from the subsoil is of great service in the vegetable economy, and affords another strong reason for a frequent stirring of the surface in dry weather, since this process greatly promotes the upward tendency of the moisture of the lower strata.

It must be evident from what has been said that draining is not so necessary here as in England, or in any country with a moist climate. This remark is general, however, and does not apply to our low, swampy lands, over which the fogs are often seen to linger, and on which the water is allowed to stand and stagnate, but only to such as dry early in spring, so as to admit of being worked over soon after the snow disappears.

This brief notice of the climate in which we live may serve to excite our interest in the subject, and a desire to pursue it further; and when it is considered that upon its climate depend both the animal and vegetable productions of a country, and that upon these depends the population of that country, the importance of agricultural meteorology, as a branch of the farmer's knowledge, will be apparent to all.

Some account has already been given of the results of experiments with guano; but the great difference of opinion among farmers upon this subject, and the great importance of arriving at correct conclusions in relation to it, seem to make a somewhat more extended discussion of the qualities of this manure not inappropriate in this connection.

The history of guano is already well known, and I need not dwell upon it. It is found in immense quantities, the accumulations of centuries, often two hundred feet in depth. Its virtues are condensed into the smallest bulk. The best guano comes from islands where it never rains; but the very heavy dews which fall there moisten the surface of the deposits, and the hot suns harden this damp surface into a crust, which entirely prevents the escape of the fertilizing gases, thus preserving all the valuable qualities of the article as a manure. If the guano were washed by the rains, and were exposed to the constant evaporation which would follow without such a crust for its protection, it would scarcely pay the expenses of transportation.

The past year has been extremely unfavorable for all experiments with concentrated manures, tried merely as experiments, and its experience can hardly be considered a fair test of the merits of any manure, and especially of a manure which, from its volatile nature, requires to be immediately dissolved by moisture and distributed through the soil. It is desirable, however, to know the risks which must be incurred, as well as the profits which may be gained, in every operation of the farm. If guano should be found to produce comparatively little or no good effect in dry seasons, this consideration should have some weight in our decision upon the expediency or inexpediency of its use. Many failures have been brought to my knowledge in various parts of the State; of these, some probably arose from the drought, others from want of knowledge or care in the application. In seasons like the past, this manure frequently does little good. There must be moisture enough after its application to dissolve it. Having occasion to top dress an acre of grass, seeded in September, 1853, I mixed 300 pounds of guano with common garden soil in the proportion of one to three, and sowed it upon the last light snow in April. The subsequent rains dissolved it and carried it into the soil, which was a very light, dry, gravelly loam, of no more than ordinary fertility, situated upon the sea shore. The acre produced more than two tons of superior hay. Without the guano, I do not think the produce would have been half as good. If it had been applied a week or two later, the effect would undoubtedly have been far less perceptible.

I do not think it safe, as a general rule, to put it in the hill and to plant corn or other crops upon it, or even to bury it, as many do, to the depth of a half inch or more with soil, and drop the seeds upon that. This method may succeed sometimes, but there are some objections to it. In the first place, the guano should be in the ground, it seems to me, before most crops are planted, that it may be so completely dissolved and incorporated with the soil as to produce its full effect. In the second place, the rootlets of plants in spring are exceedingly tender; and when they shoot down into the guano, as they will, in most cases, before it is so mixed with the soil as to have become harmless, they will inevitably be destroyed; and if the destruction of the whole plant does not follow, it will have but a sickly and feeble growth. No guano is worth fifty dollars a ton that will not produce this effect. In the third place, in cases of drought, guano in the hill, however perfectly it may have been prepared before its application, will ordinarily prove an injury rather than a benefit. It seems difficult also to see the advantage of this practice; for we need have no fear that the roots will not find the manure if it is mixed with the soil.

I do not wish to be understood to be opposed to the judicious use of guano. It is now pretty generally agreed that ammonia is the substance which stimulates most powerfully the growth of plants; and if the farmer has not enough of it in his home-made stable manure, guano is the cheapest form in which it can be bought. It not unfrequently happens that, after using all possible means at command, by way of the muck meadow, loam, leaves, and a thousand other things within the reach of most farmers, for increasing his supplies, he still fails to make as much as his land demands. It then becomes a question of importance with the farmer where and how to supply his wants the cheapest and with least labor. It is a question of dollars and cents, and the man who knows his own interest will study it out.

The farmer will sometimes prefer a cheap kind of guano to the best Peruvian, simply because the price is a little less. There can be no greater mistake. The properties of the best guano are well known, and we can predict what results will follow the application of a certain quantity per acre. With most other guanos there is no certainty as to the results, and the difference in price is seldom proportionate to the difference in quality. The risk in buying them is consequently much greater, and the farmer cannot ordinarily afford to sacrifice both the price of the manure and the time and crops which he may lose by his mistake. The only safety is in getting the best warranted guano from dealers who can be relied on.

It often happens that the soil is of such a nature as to make some change in its physical texture desirable. It is too stiff, or too light. There are cases, doubtless, where a thorough dressing of stable manure would be more beneficial than guano or any concentrated manure. The farmer must decide all questions of this kind by the aid of a sound and enlightened judgment. In most cases it is not well to use one kind of manure on the same land many years in succession. Thus, on soils where a coarse manure is needed, it will often be found useful to mix guano with it, and an excellent compost may be made in this way. The guano, when so mixed and ploughed in, is very soon decomposed, and supplies the plant with food almost immediately; while the coarser manure, as its decomposition goes on more slowly, becomes available at a later stage of vegetable growth. This method of using guano, I think, should be adopted much oftener than it is.

There have been too few experiments to determine with certainty the effect of guano, when used for several successive years on the same soil. I give below extracts from the statements made by experienced practical men, which show not only the results obtained, but the manner of preparation and application. A farmer of Worcester county says: "Where guano has been spread and ploughed in, the result is satisfactory; when applied to corn in the hill, in most cases unsatisfactory. Experiments with phosphate of lime have generally been satisfactory."

An experienced farmer in Middlesex county writes as follows: "The best results have been realized when it has been sown on grass lands in the spring as early as the month of March. Where it has been used for corn, some have succeeded well; others have not, for want of knowledge in using it."

Another successful cultivator says: "I have used it with plaster on oats sown broadcast for fodder, and ploughed in two or three inches deep, in the spring. It increased my crop of oats fifty per cent. It is worth the most for any crop when put under the ground two or three inches and well mixed with the earth."

The return made by a farmers' club of Middlesex county, in which the circular given above was taken up and carefully considered, contains the following reply on the subject of guano: "J. P. B. applied 300 pounds per acre; on the same land he applied 20 loads of compost manure, and had one-sixth more corn on the compost manure. J. H. got no pods on an eighth of an acre of pease. J. B. M. sold $20 worth of pease from one-sixteenth of an acre. He doubled his crop on guanoed land, but found no effect on grass land. On poor sandy soil E. W. B. found his corn, rye and grass improved; guano saved the corn. He got double the crop on grass land where guano was applied in the autumn; would always mix with charcoal, plaster or muck, 60 pounds to the cord of peat muck. E. W. found nearly a fourth more millet on seven-eighths of an acre, where 25 loads per acre were applied, than where 300 pounds of guano were applied. J. D. B. doubled his crop of potatoes by the use of 300 pounds of guano per acre, applied on low land in the hill."

Another practical farmer of Middlesex county says: "Guano has been used by some few individuals to a limited extent. In several instances it has proved an unprofitable investment, on account of the want of knowledge how to use it, having placed the seed in too near proximity to the manure, which, being very powerful, destroyed the germ, or prevented its growth. Light or sandy lands seem to be most benefited by guano, or its effects are more perceptible on such ground than on land in a high state of cultivation. It has been said that the first crop obtained by using guano was the best, and that the third or fourth season there would be but a very meagre one; but I think that statement remains to be tested.

Different kinds of land require different kinds of manure, as is well known by most farmers. On cold, clayey soils, the horse or stable manures seem to produce the best return, and to leave the ground in a better state than some other kinds of manure; while on loamy, sandy, or gravelly soils, the barn manure, formed into compost, is considered by most farmers as best adapted to produce a crop. Much use is made of swamp muck in forming a compost for manuring loamy, sandy, or gravelly soils, being worth for such purpose not less than $1 per cord; and, especially where manure is used in the hill, the *muck* is an almost indispensable requisite; for the difference between using *clear* manure and one half or two thirds muck in compost would be in favor of the muck compost."

Another writer from Essex county says: "I have used two tons the past season, which I think is full half used in town. I applied it to some extent upon all crops raised upon my farm, mixed in the proportion of one part guano to four of loam in bulk, for grass land, and spread at the rate of 300 pounds of guano per acre. It increased the product but very little on high and dry land; but on low, wet land, it more than doubled the first and second crop of grass. On greensward land, where 15 loads of manure from the barn cellar were spread and ploughed under, guano, mixed as above with meadow muck, and applied in like proportion to corn, spread and cultivated in, increased the crop full one-quarter; but when put in the hill and covered with one inch of earth it diminished the crop about one-fourth, not more than three-fourths of the seed vegetating. I fenced in forty square rods of land from my pasture, and divided it into four lots of ten rods each, the soil a strong black loam, and rather moist the first part of the season. On the 29th of April, during a north-east rain, I applied to lot No. one 20 pounds of plaster; to No. two, 20 pounds of guano, mixed with three times its bulk of loam; to No. three, 20 pounds of guano and 20 pounds of plaster; to No. four, not any thing. The last of June following, the grass on lots Nos. one and two was about alike, being nearly double of lot No. four; but on No. three the product was more than threefold. After that time the cattle were allowed to feed upon it; the season continued so dry, I could not perceive much difference in the feed late in the autumn."

A farmer of Barnstable county returns the following answer: "I have used guano on grass lands, both swamp and upland, with good success. To a limited extent it has been used by others, on grass lands, with success—in small experiments doubling the crop. On corn it has proved, on the whole, injurious. I have applied it on a section of corn land, in the hill, with great loss—mixing it with dry peat muck before applying it, and covering the mixture with two or three inches of earth. The only missing hills in the field were in the guano part; the growth of stalk was promoted, but the yield of corn not so good as when compost was put in alone. In the year 1853 I used it on corn with similar results. I should discard it for corn or garden crops, feeling more safety and confidence in good compost manure. On a section of the above-named field superphosphate of lime was used, applied in the hill. It produced an early, marked growth of stock, but on harvesting I have no better result than on any other section of the field; the land was light, and the dry weather prevented a fair test. I shall try it again next year; I have more confidence in it than in guano, as it can be safely applied."

A Norfolk farmer says: "When judiciously applied, guano has resulted well, especially on mowing lands, doubling the growth. In the cornfield I did not see a marked difference. It was very favorable to oats and turnips."

Another in Worcester county answers: "I have applied guano this season without any visible effect. Others have been more fortunate. In some instances the benefit to the corn crop has been very perceptible, increasing it twenty or twenty-five per cent. About twenty tons were used in town last spring. From the best information I have obtained, I think for a crop of corn it is more beneficial on light land or pine plain; for grass, on land rather low and moist. Others within my knowledge have used it in successive years, and generally with less success the following years than the first. In one case that came under my observation, the crop the second year was an entire failure."

From these returns, all of which come from experienced practical men in various parts of the State, and from many more like them which my present limits do not allow me to give, we may deduce the following general principles:—

I. That guano generally succeeds better on light, loamy lands than on stiff, clayey soils.

II. That it is not safe to use guano in the hill, unless it is largely mixed with other substances, or intimately mingled with the soil of the hill.

III. That it may be spread and ploughed or harrowed in for corn, or other cultivated crops, to great advantage, particularly in wet seasons; and that it may be thus used with perfect safety, without any previous preparation, except crushing or pulverizing the lumps.

IV. That when it is to be applied as a top dressing it should be well pulverized, and thoroughly composted with muck or loam, and then be spread upon the land very early in the spring.

These results, conflicting as they do with the experience of some, cannot perhaps be regarded as fixed, since many more experiments, accurately conducted under every variety of circumstances, are needed to enable us to fix any rules for the preparation and application of this powerful manure.

But almost inexhaustible supplies of material for making excellent manure may be found in the swamps and bogs which abound in nearly every part of Massachusetts. The term *muck* is generally applied by New England farmers to the mass of vegetable matter usually found in peat swamps in a state of partial decomposition; by English farmers, to rotting straw, &c.; and by the Scotch, to barn-yard manure. I use the word in its common signification in this country, and mean by it the dead vegetable substances described. These are the remains of trees and plants, some of which must have lived ages ago, more or less perfectly decomposed, and sometimes extending to a depth of many feet. This substance is made up of different constituents in different localities, and its quality is therefore very variable. Hence we find a great variety of opinions as to the value of swamp muck as a manure. The various estimates of the value of swamp muck range from 33 cents to $3 per cord, and give an average of $1.27; and as there is no reason to suppose that the estimated value is not the real value in each locality, it follows that no general real value can be definitely fixed. This depends on its quality.

Swamp muck is often cold and sour, and requires the addition of lime or exposure to the atmosphere and to frosts before it can be advantageously applied as manure. There are different modes of preparing it for use. The most common is to dig it out, expose it to the frost through the winter, and then put it into the barn yard to be composted with the stable manure. The following statements are from experienced practical men, and each gives the results of the observations of its writer.

A Middlesex farmer says: "I use swamp muck most successfully composted with stable manure on different varieties of soils, but think it does best on high land of a loamy soil. I notice it is used very extensively by farmers with satisfactory results when composted with other manures thoroughly." A farmer of Worcester county says: "I use it extensively on my hard, clay soils; it works well on dry lands to keep them moist, and on clay soils to keep them light." Another writer from Dukes county follows: "It should be hauled out in the fall, and exposed to the frost during winter, and mixed with stable manure in the proportion of two parts muck to one of manure; it should also be used in the hog pen, barn yard, and barn cellar. I have found it a good manure on loamy, gravelly, and sandy land, especially for top dressing for grass, when composted as above." A Norfolk county farmer, who has met with great success, says: "The best way of using swamp muck is to dig it and expose it to the sun, air, and rains one year, and then, when in a dry state, place it in a barn cellar where it will take the droppings of the cattle above until it is thoroughly saturated; then mix it well, and it is ready for use. It is good for all high lands." He estimates it at about three dollars by the cord of one hundred and two bushels. A Middlesex farmer of great experience states that "swamp muck is of different qualities, and varies as much as wood when used for fuel. Peat mud, the older the better, consists principally of vegetable matter. It has most effect on high and dry ground. Wood ashes are the best article to correct its acidity."

Similar accounts come from every section of the State. From Hampshire county we have the following: "The best method of using swamp muck, judging from experiments of my neighbors and my own, is to cart it out in the autumn, expose it to the frost and snows, then spread and plough it in in the spring on sandy, dry soils, or, in other words, on soils of an opposite nature to its own. I ploughed in twenty-five loads on one-quarter of an acre last spring, and planted it to early potatoes, corn, pease, cucumbers, squashes and melons. It was a great preventive against drought. That ground has been sown to rye, and it looks first rate." And from Plymouth county: "Swamp muck, as also upland soils, are valuable to mix with various kinds of manure to retain and absorb the salts. For upwards of two years, I have adopted a different course with my swamp land from any I know of. I employ men with long-bitted hoes, and sward hooks, &c., to dig up the hummocks and bushes, in bodies large and small, as is convenient, and pile them in bunches for a few days to dry; after which I select a central bunch, in which I form a cavity or hole near the bottom or surface of the ground. Then I set fire to some of the dryest and most combustible, and as it burns I replenish it from the other bunches, smothering in the coal-pit form, though more combustible, till it is burned down to a perfect body of ashes and sand. I have not carried the experiment into full effect as I designed to; but, so far as I have used the ashes, they have given me entire satisfaction. Their nature is to improve exhausted lands; and my belief is that they may be spread upon the same land upon which the ashes were made, and increase the growth of English grass. Much has been said upon the subject of reclaiming wet, swampy lands; but after all that has been done, as I understand it, a coat of manure is required to produce a good crop of English grass. Now, if our worthless swamp lands possess the very article required to produce such grass by the simple process as above named, I think it would be an improvement in one point of agriculture."

A farmer of Barnstable county says: "The best compost manure is made in our barn and hog yards, of swamp muck, seaweed and animal manure. Swamp muck and seaweed are accessible to all who will take the trouble to procure them. My barn and hog yards are so excavated and dug as to absorb the liquids passed into them. Every spring and summer, after my barn yard is emptied, I replenish it from time to time with swamp muck, peat, seaweed, and other materials from the farm, which, with the animal manure produced by yarding my cattle, furnish me in the autumn with 200 loads of good compost, which I either stack in the yard, or cart on to the land

I intend to plant in the spring. I again replenish the yard, giving me, with the proceeds of my hog yard, from 100 to 150 loads more in the following spring. In addition, I have for two years past composted, in the field adjoining my peat bog, from 75 to 100 loads of peat (thrown from the pit in summer or autumn) with sea and rockweed, or ashes and animal manure, which I esteem of equal value to barn-yard manure. I estimate the value of a cord, or four ox cart loads of barn yard manure composted as above, at from $4 to $5. We esteem the value of this for a corn crop and the improvement of land higher than pure animal manure."

I give one more extract from a farmer of Berkshire County. He says: "I have used swamp muck for a number of years past with good results, by mixing it with yard and stable manures in the proportion of one-third to one-half muck, and consider it worth one dollar per load to use for agricultural purposes on soils that are a mixture of loam and gravel."

The testimony is uniformly in favor of composting muck with other manures. Its power of absorbing valuable liquid and gaseous substances is very considerable; and this makes it an excellent substance to mix with guano when the latter is to be used as a top dressing. The importance of a free use of dry swamp muck as an absorbent of the liquid manures of the barn and stable can hardly be over-estimated. The loss throughout the State from the neglect and consequent waste of these rich manures, which, with a little care, might all be saved, is almost incredible. The attention of farmers was but lately called to this subject; but the value of these substances is acknowledged by some, and efforts are now made to save them by means of the use of muck and loam, either properly composted in the barn cellar, or supplied daily to the stalls of cattle. No judicious farmer should neglect to save all such substances as tend to increase the value and productiveness of his lands. It is poor economy and bad calculation to buy concentrated manures, or to buy any manures abroad, till every thing of the kind is saved at home.

From what has been said, we may infer that good dry swamp muck is worth on an average from $1.25 to $1.50 per cord; that it is best on light, loamy, sandy, or gravelly soils; and that it is valuable as a compost with barn-yard manures, or with guano.

The introduction of improved machinery for farming purposes marks the progress of agriculture, and foreshadows the advantages to be expected hereafter from the application of science to this art. Implements are now constructed on strictly scientific principles. Among those lately introduced, by way of experiment, is the mowing machine. About one hundred and fifty of these machines have been used in this State the last year. There is no doubt that such improvements will be made in it as to make it exceedingly valuable, and indeed, on many farms, quite indispensable.

CULTURE OF THE HOP.

I have very often been applied to for information respecting the cultivation of hops. The inquiry upon this subject has become so great, and the sources of information are so few, on account, probably, of its being a local product, that it seems important to state the results of my studies and observation upon it. Having spent the early part of my life in the immediate vicinity of a hop-growing district, and having subsequently, in the course of my investigations, connected with official duties, obtained many statistics and facts from successful growers in this Commonwealth, I have determined to imbody them in the form of a report upon this crop.

Its Natural History.—The hop (*humulus*) is a hardy, herbaceous plant, of the nettle order, constituting a genus by itself, under the name of Lupulus. The common American name for it is from the old Saxon *hoppan*, "to climb," and the generic botanical term, *humulus*, is from the Latin *humus*, fresh earth, and applied to it on account of the natural habits of the plant, when left to itself, of creeping along the ground. Its specific botanical name, *Lupulus*, was given it by the Romans, because when growing among the willows it twined around and choked them, proving as destructive as the wolf. The old English name signified the "bane of the wolf."

The male and female plants are distinct from each other, the cup of the former having five stamens or leaves, that of the latter only one large oval leaf. The root generally sends up many rough, flexible stems, which twine from left to right around poles or upright supports to a height varying from ten to twenty-five feet. The leaves are indented like a saw, shaped like a heart, opposite to each other, and growing on small stalks, rough, or covered with prickles like a nettle, and of a dark-green color, sometimes entire, and sometimes divided. The flowers of the male plant grow in clusters a little like currant blossoms, with a calyx of five oblong sepals, and five short capillary filaments, and upright double-celled anthers. The flowers of the female plant are cones, strobiles, or catkins, of many scales, and of an ovate form, pendulous, and slightly resembling the cones of a pine. They are covered with a fine yellow powder called Lupuline. The scales are of a pale green, overlapping each other. It has two downy styles, shaped like an awl, and spreading. The stigmas are simple. Each enlarged dry scale has a single seed attached to its base, round, and of a brownish color, having a sharp rim. The blossoms of the hop are bitter, and slightly narcotic, and are the most valuable part.

But one variety of the male plant is known; while several distinct varieties of the female are well known, and have been cultivated from remote antiquity. The chief varieties known and cultivated in England are the golding hop, known and cultivated here also; the Canterbury grape hop, also grown on rich soils in the county of Kent; the Mayfield grape hop, grown on nearly all kinds of good soil; the golden-tips hop; the Farnham, celebrated in some sections for its superior qualities; and the Flemish redbine, a coarse and hardy variety, more nearly approaching the wild plant than the others. The grape hop is common here.*

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* There is a plant improperly called the "tree hop," the fruit of which is sometimes used as a substitute for the true hop. This is the *Ptelea trifoliata* of Linnæus. It is the Shrubby Trefoil, sometimes called Swamp Dogwood, or Stinking Ash. It is a beautiful shrub or small tree, with greenish-white flowers, growing in clusters, and resembling the common hop. Its name is derived from a Greek word, signifying *to fly*, from the resemblance of its fruit to that of the elm, being furnished with a thin covering like a wing. Its bark and foliage are bitter and aromatic, acting as a tonic. It has but few branches, brittle, and filled with pith. Its bark is of a beautiful, smooth purple. It may be easily propagated by cuttings, seeds or layers. It is an inferior substitute for hops, though often used for yeast and other purposes.

Its History as a cultivated Plant.—The hop grows wild in Sweden, Germany, Switzerland, England, and in Massachusetts, where it is indigenous. It is probably indigenous also to Europe, though supposed by some naturalists to have been brought there by the Goths at a very early period. It was known, probably, to the Greeks and Romans. It became more known as a cultivated plant in modern Europe after the 8th and 9th centuries. It was cultivated in Germany in the 14th century, and introduced into England, but not much cultivated, previous to 1524. The prejudices against this plant were at first very great, and Henry VIII. ordered the brewer not to put hops into the ale. Its cultivation was afterwards encouraged by acts of Parliament. One of the first works published on this subject was, "A Perfite Platforme of a Hoppe Garden" in 1578. The cultivation of hops in Sweden was regarded of so great importance that every farmer was required by law to have at least forty poles of them; and in failure of this he was punished, unless he could show that his land was not capable of producing them; and the picking of them before they were ripe was followed by a penalty. The cultivation was brought to considerable perfection there as early as the close of the 17th century. This plant was introduced into Massachusetts at a very early date. "Hop rootes" were ordered by the Governor and Company of the Massachusetts Bay in New England in 1628.

The cultivation of this crop in Massachusetts has grown up for the most part within the last seventy years, and its history is so interesting as to merit a more extended notice than my present limits allow.

In 1789 some eight or ten of the principal growers of hops met at the house of Samuel Jaques, Esq., one of the largest hop growers of Wilmington, for the purpose of ascertaining the amount of hops grown in the State. The quantity was so limited, and the number of growers so few, that those present could name both the growers and the quantity each raised throughout the whole country. Previous to that time only about thirty thousand pounds had been grown in any one year in this State, and by far the larger part of those was raised in Wilmington and a few adjoining towns in Middlesex county.

The mode of picking and drying was very defective. The hops were picked in clusters, stems and leaves often thrown in, and the drying was done by wood; so that, when taken from the kiln, they were "brown as a leg of bacon, and about as much smoked."

Colonel Samuel Jaques, who may justly be called the founder of this business, was the first in the country to dry hops with charcoal, in September, 1791. At the suggestion of Robert Laird, a Scotch brewer, who afterwards lived many years in Newburyport, young Jaques, then a lad of fifteen, but already sufficiently advanced to be intrusted, in the absence of his father, with the responsibility of overseeing the harvesting of the crop, gave directions to have the hops picked entirely free from stems and leaves, sent at once to a neighbor's for a load of charcoal, and produced the most beautiful kiln of hops that had ever been dried in America. He was not only astonished himself, but astonished all the neighbors. When his father returned on Saturday night, and beheld what had been done, he could hardly restrain his joy and delight, for a new era had begun in his favorite pursuit.

The superiority of this mode of picking and drying was so apparent that in 1792 it was pretty generally adopted, and has been practised to this day; for, as this article became valuable from these improved processes, the demand increased, doubled and tripled, the culture extended, and the slips or cuttings to form new plantations soon rose to exorbitant prices.

It was the universal custom at that time to pack the hops in round bags, without any uniformity in length or size, by treading them down with the feet in the rude manner still practised in England. The consequence was, that the tops were bruised and broken, causing great loss in strength and value by evaporation of the essential juices of the plant, its most valuable properties, to say nothing of the impossibility of packing closely for transportation. Young Jaques, leaving his father after the harvest of the crop of 1797, came to Charlestown, and soon commenced packing hops in square bales, by means of screws. The superiority of this mode was so apparent that it soon became general.

But difficulties often arose among merchants, from the fact that old or refuse hops were often found mixed up with good ones. No proper distinction was made between the different qualities. Vexatious lawsuits would sometimes occur, and the price of the best hops was naturally lower than it otherwise would have been. To remedy these evils, the Legislature of Massachusetts created the office of Inspector General of Hops in the year 1806. This was the first movement of the kind in this country, and, so far as I know, the first provision for an inspection in the world. Col. Jaques was appointed inspector. The office being new, there were no precedents for classifying hops, and some system was to be adopted. But some hop dealers and some hop growers were opposed to a high standard of inspection, and the inspector met, of course, with many difficulties. It is but justice to him to say, that, by the conscientious use of his "first sort" brand, Massachusetts for many years monopolized the trade in hops, for the character of our hops became the best in the United States. His system was complete, and the growers were soon brought to improve their hops, in order to bring them up to a high standard of perfection. Those who sent orders from Europe to agents in this country required their hops to be inspected in many cases in Massachusetts, and Col. Jaques' brand generally commanded a cent or two on a pound more than that of any other State.

It was the pride of Col. Jaques that no bale marked as "first sort" ever failed to prove so, and it was this high standard that gained for the Massachusetts crop an enviable reputation both at home and abroad, and there is no other means of securing any permanent annual foreign demand; while, the moment the standard is lowered, the moment the dealers find bale after bale branded as "first sort" when they should have been "second," or branded "second sort" when they should have been "refuse," they begin to look with distrust upon the whole. It is, on the whole, for the interest, both of the grower and the dealer, to maintain the highest standard of perfection, and that the truth should be stamped on every bale.

The Legislature, in 1816, passed a law requiring all inspectors to make annual returns to the office of the Secretary of State. But Col. Jaques, from the beginning, foresaw the want of more accurate and reliable statistics of all our staple products, and, as early as 1806, adopted a system by which, when these returns were required by law, he was enabled to present them from the first year of his inspection, and by these he could tell how many bags of hops were raised in the State, by whom raised, and in what town, to whom sold, the weight and the quality of each bag, the price, &c. In these returns we have more perfect statistics of this crop for the last half century than any other State in the Union. These returns will be referred to in speaking of the cost and profits of this crop.

Col. Jaques resigned the office of Inspector of Hops in 1842. The crop in Massachusetts, in 1840, was returned as 237,941 pounds, estimated to be worth to the growers no less than \$71,382.30. From that time the prices fell, till only 150,655 pounds were reported in the official returns of 1850, valued at \$37,663.75. The average price per pound, in 1847, was but 6¾ cents; and in 1848, but 7 cents. Among the reasons for these low prices was the fact that the quality of Massachusetts hops had somewhat depreciated, and consequently their reputation was greatly injured. The cause of the depreciation in quality will be alluded to hereafter.

Location.—The land designed for a hop plantation should be as free from exposure to the winds as possible, since at certain seasons it is liable to be greatly injured. Level ground is better than a hillside.

The hop is said by some to flourish best in a moist climate. The finest varieties are cultivated to the highest degree of perfection in England, the climate of which we have already alluded to in a former part of this Report. An English writer affirms that the north of England and Scotland are too cold for the successful cultivation of these varieties of the hop, and suggests that if it is at all attempted on a large scale, or in field culture, the coarse, hardy Flemish redbine be used. The latitude of Edinburgh is 55° 57′, that of Boston 42° 21′. The mean annual temperature of the former is 47°.1 F., that of the latter 48°.9—showing but a slight difference. But a comparison of the mean spring and summer heat of the two places shows a very marked difference. Our winters are far colder, and our summers far hotter, than those of Scotland; or, to resort to accurate statistics, the mean temperature of the growing months for the two places is as follows:—

Edinburgh.			*Boston.*		
April,	44°.1	Fahr.	April,	47°.4	Fahr.
May,	50°.3	"	May,	56°.5	"
June,	56°.0	"	June,	66°.2	"
July,	58°.7	"	July,	71°.6	"
August,	56°.8	"	August,	69°.4	"
September,	53°.4	"	September,	62°.2	"
October,	48°.8	"	October,	51°.5	"

This shows a very marked difference in our favor, so far as requisite heat is concerned; and on this point there seems to be no reason why we may not, by proper cultivation, grow the finest varieties with complete success. It has been said that the plant is indigenous to our State.

Soil and Mode of Culture.—The hop may be cultivated with success in a great variety of soils; but it flourishes best in a deep, rich, mellow loam, with a subsoil of medium stiffness. In general, it may be said that good corn land is good hop land. The soil of Wilmington, one of the first and largest towns engaged in hop growing, is generally of a poor and light description—a sandy loam; and it is worthy of remark, that the hops are better on soils which will raise only from a quarter to half a pound to a hill than on those which raise a pound or a pound and a half.

The roots of the hop extend to great depths when the soil is of suitable character and properly prepared, and the best cultivators take great pains to loosen and pulverize it thoroughly and to manure it well. The first ploughing should be ten or twelve inches deep. The hop farmers of Kent and Surrey, among the most noted hop districts in England, first plough very deep, and plant with some cleansing crop, and then manure with twenty-five or thirty loads of good barn-yard manure per acre. The land is then frequently sown with turnips, when sheep are folded upon it in the early part of winter; after which it is deeply trenched and thrown into ridges, to lie, during the rest of the winter, exposed to the frosts and air.

The trenching is done with the spade, two spits deep, in the most thorough manner; but a more economical method is by the trench plough, or by the Michigan sod and subsoil plough.

The hop is commonly propagated from cuttings, and sometimes by young plants grown from the seed. The cuttings may be taken fresh from the crown of the long roots, and planted directly in land previously prepared for them; or they may be rooted after the manner of layers, and then planted; or the fresh cuttings may be rooted in a bed, and transplanted from that to the place intended for them. Cuttings which have been rooted generally grow more rapidly and arrive at maturity earlier than fresh cuttings, which gives them an advantage.

When shoots are to be used as layers they may be twisted at the joint above which they are to be buried in soil, and bent down and fastened, and then covered up. This is usually done in a careless manner at the first hoeing, the loose, straggling vines being buried up without any particular regard to depth or neatness; and when the vines are covered in this manner, they are not long in taking root. As soon as they have taken root, they may be cut from the parent stalk and transplanted into the ground prepared for them, each slip being six or eight inches long, and having three or four eyes, or joints. When it is designed to treat the cuttings in the nursery bed, they are taken from the crown of the root or from the stalk of old plants at the time of dressing in spring, which will be hereafter mentioned, and allowed to remain in the bed till they are well rooted. The cuttings are made about eight inches long; and if they contain more than four buds or joints, they are trimmed. Care should be taken to allow only one male plant to a field, and it may be set by the side of the road at considerable distance from the field and left to take care of itself. This caution cannot be too strictly observed; for our hops have deteriorated from too much seeding, which has arisen from allowing the male plants to increase. Some allow one male plant to fifty, and set it in the field with the rest. This is too much; for, where hops are over-seeded, they ripen prematurely, and turn brown so fast as not to give time to pick them in the proper state of maturity. If any male plants are allowed to stand in the field, one hill to five acres is enough, and care should be taken to prevent them from multiplying.

The preliminary processes are well described in a letter from a hop grower of great experience in the town of Wilmington. "Deep, loamy soil," says he, "is the best for hops. Good corn land is always good hop land. To prepare land for hops, plough nine or ten inches deep; spread eight cords of manure to the acre; mix it with the soil by cross-ploughing; furrow or mark out the land the same as for corn; plant the hop roots in every other row and every other hill; this gives three-fourths of the ground for corn or potatoes the first year. Hops have running roots, from one foot to three feet long, with joints or eyes to them. These roots are cut from the old hill every spring after they have been planted two years. The joints or eyes are two or three inches apart. These are the roots to plant; cut them so as to have three joints to a piece, and put three pieces to a hill. Cover them three inches deep. The first year they produce no hops. The second year the quantity and quality are likely to be as good as ever from the same field. Hops are commonly planted at a distance which gives eight hundred hills to the acre. They do not commonly receive, after being planted, more than two shovelfuls of manure to each hill. This makes about four cords to the acre. They are on poles from thirteen to twenty feet long. There are some farmers in the west part of our town who are making some improvements in growing hops. As I pass by their yards, I notice the poles are longer than they were in former years.

"In the early part of my life I lived with the largest hop grower then in Reading. After leaving him I raised hops for myself four years, and from experience I am satisfied that it is as easy with new white birch poles twenty-five feet long, instead of poles from thirteen to twenty feet long, and with eight cords of manure to the acre in the place of four cords, to raise from one thousand to sixteen hundred pounds to the acre, as to raise one-half that quantity with the short poles and small quantity of manure. The hoeing would be the same, and the picking would be less. The long pole, if it has ever so many hops on it, is always easier and quicker picked than the short pole. It is seldom we see first-rate hops growing on a short pole; equally as seldom do we see refuse hops growing on a long pole. It is said by some that long poles strain the roots. I think it more straining to the roots to have vines go beyond the top of the short pole, bend and split open, the sap of the vine running out, and the hops starving for the want of it. I once knew a man who tried the experiment of white birch poles twenty-five feet long. The result was, that two men built a hop bin in the morning, carried it out into the field, and picked forty-two hills, which produced one hundred and one pounds of first-sort hops, inspected by Col. Jaques, and pronounced by him to be the best that season. Fifty pounds would have been a great day's work of short poles."

Another practical hop grower, writing from Lunenburg, says: "In answer to your request for information respecting the cultivation of hops in this town, I would reply, that there are fifteen hop growers, and the quantity yielded the present year was about fifteen thousand pounds. With respect to the mode of cultivation, the ground is ploughed as early in the spring as it can conveniently be done. The hills are then opened and the running roots cut off. They are then manured upon the hill with one or two shovelfuls of good compost manure, which is immediately covered with the hoe. They are then ready for the poles. After these are set, and the vines are of suitable length for tying, this is done. They are then ploughed and hoed. This is usually performed three times before haying, and once after, this last being principally for the purpose of keeping down the weeds. At the proper time, usually about the first of September, picking is commenced. Some two or three weeks after picking and drying they are pressed into bales of suitable size, and are then ready for the market."

From what has been said, it will be seen that the proper time for setting out the roots or cuttings is in the spring. These do not grow luxuriantly, and need not be poled the first year. Some cultivators are accustomed to cover the hills in the winter with a shovelful of manure, to prevent any liability to injury by the frost. What has been said above from practical and experienced cultivators in this State will give an idea of the mode of treatment during the first season, and to some extent during subsequent seasons, of the hop plantation.

From the following extract from the British Husbandry, it will be seen that the practice is a little more thorough in England, though substantially the same: "When the spots for the different hills have been marked out, the earth is dug out of each to the depth of about two feet, and of nearly the same width; and then, if a portion of fine garden mould can be got, or, if not, a compost of well-rotted dung and earth, it is placed in the holes, which are filled with finely-pulverized soil. The plants are then put in. Some put three or more in a circle, [hill,] others two, and some only one good plant; but the most general plan is to place three in each hole, at the depth of about six inches, and great nicety should be observed in fixing them. The holes made by the dibble for that purpose are in a slanting direction, outward, so that the roots of the hop may grow in an inclined position, in which the poles are afterwards placed, without allowing their vines to be interlaced. Some careful growers, indeed, put the fine mould gently in, around and upon the plants, with the hand. The plants should also be raised above the natural level of the ground, both in order that the hop may rise high enough to form the hillock to be made around them, and that the roots may have a great depth of loose earth below them; for, when the land is very open, they penetrate so far into the soil that they have been found on a very rich, deep loam, in the neighborhood of Farnham, to the depth of twenty feet."

Setting the Poles.—The proper length of poles requires much judgment. The vines themselves indicate sufficiently how long a pole to use. The poles are of various lengths; and if the vines in a hill are very large and thrifty, they will need a longer pole than if they are smaller and more feeble. The quality of the land is also some indication, as well as the quantity of manure used. If the land is very rich, it will produce a much more luxuriant growth than if of a poorer quality. The expense for poles is a large item in the original outlay for hop growing. It will be seen, from the opinions of the writer of the communication quoted above, that the method of poling is a matter of considerable consequence. The English growers often use a much larger number to the acre than experienced growers with us. It is very common in the Kent and Sussex hop plantations to see as many as two thousand five hundred or three thousand poles to the acre. Sixteen or eighteen feet is as long as it is thought best to use them by many English growers, and it is not uncommon to see them from ten to twelve, or fourteen, feet; and the reason given for using short poles is, that the use of poles longer than the natural growth of the plant coaxes it too high, and stimulates it beyond its strength, and causes a feebleness in its roots the next year; while, if the poles used are found in summer to be too short, the tops of the vines may be supported by others. The usual time for poling hops with us is in May; for plants grown from cuttings, the second year of their growth; and for plants grown from seed, the third year. The poles, two in a hill, eighteen inches apart, are usually inclined a little outwards, at the top, and towards the south, in order to give the greatest freedom of circulation to the air, secure greater sunlight, and a greater chance for the vines to swing free from the poles; and unless this inclination is given the tops of the poles, the vines are said to "browse;" that is, they become matted together and injured, and are much more liable to blast. And the same objection exists to the use of more than two poles to a hill; the vines are more apt to "browse." Cedar, hemlock, spruce, ash, chestnut, maple, pine, willow, and other kinds of poles are often used, and in some locations in this State the birch is not uncommon in hop grounds. This latter is considered bad in England. In many localities birch poles are cheaper, and far more easily procured; though, for lightness, beauty, and durability, the cedar or the hemlock are preferred by those who can procure them without too great expense. The American hop seems to prefer to cling to a white birch. The main objection to this wood is its rapid decay, making it unsafe to use it more than one year. Perhaps, on the whole, if the birch is not used and renewed every year, the spruce is the neatest and cheapest, considering its lightness and durability. It will last five or seven years, or even longer, and, when the bottom is decayed, may be cut off and used shorter. The number to the acre will of course depend upon the number of hills, which are usually at least from six to eight feet apart, making from sixteen to eighteen hundred poles to the acre. The farmer already quoted says: "The poles are worth $2 or $2.50 a hundred, ready for setting, and will cost, at sixteen hundred per acre, from $32 to $40. But, as good poles will last ten or twelve years, the expense per year will not be much increased."

After the poles are set in the manner indicated, in rows perfectly straight both ways, two to each hill, and inclined a little outward, and the vines are long enough, two or more of the most thrifty stems should be selected and tied to each pole by a woollen yarn, or soft rushes—great care being taken to perform this operation at the proper time, and before they have become too hard and confirmed in their inclined position so as to be injured by slanting them up from the roots.

The English and French cultivators have adopted in some cases, by way of experiment, a system of espalier training, by which the vines run in a horizontal direction on a series of trellises five or six feet high. This is thought by some to avoid the great expense of poles, and also the liability to injury by high winds and storms to which long poles are subject. Some have also recommended trellises of iron wire in France, by which it is thought that a fifth part of the expense for poles is saved; but, surrounded as most of our farmers are by abundant and suitable material on their own premises, it is not probable that any resort to such experiments will at present be necessary.

Careful cultivation after the hops are poled—that is, the second and subsequent years—is required to keep the ground free from weeds and grass; and during times of drought, the more frequently the plough and the horse cultivator are used both ways the better. From what has been said, it will be evident that the plant comes to its most perfect development in a soil thoroughly tilled and pulverized. The hop requires frequent stirring of the soil in times of drought more than many other crops. The plants are greatly invigorated by it. The soil is hoed up around the hills in June or July, and many cover the hills in winter either by ploughing or by manure. Whether this is done or not, the hills are opened early in spring, and the large part of the last year's shoots, the running roots, cut off with a sharp knife to within an inch or two of the stem. But the old bine, or the tap root, which descends vertically into the soil, is not touched. The hills are opened by back-furrowing from each row of hills both ways. This brings all the soil into the spaces between the rows. Before the first hoeing the back furrows are split with the plough, which turns the earth back upon the hills. After the hills are opened by back-furrowing, they are covered with a shovelful or two of compost; or, in want of this, the finest and richest soil will be found useful.

It has already been seen that the hop vines are frequently gathered up and burned on the ground in the winter or spring. This may be done, and the ashes are of great value to the succeeding crop; but perhaps one of the most valuable manures, as well as the cheapest, is made of the vines, gathered into a heap, and left to decompose and form a rich black compost, to be applied in the spring in the manner indicated for other manure. This use of the vines has been too much neglected. Not only accurate experiment, but every principle of agricultural chemistry, shows at once how important this hop-vine manure is; for the vine contains in a concentrated form almost every constituent which it has taken from the soil; and those parts which are taken away in the seeds and strobiles of the plant can be abundantly supplied by composting these vines, chopped up, through the winter with barn-yard manure, woollen rags, fish, or other nitrogenous substances. In this manner the land is not only restored to the condition in which it was before the crop was taken away, but made as much richer as the amount of other manures used in the compost exceeds the amount carried off in the seeds and fruit of the plant.

As soon as the shoots are of sufficient length the poling is commenced, as has been said, and the vines are tied to the poles. The shoots not tied to the poles are, as already indicated, buried up in hoeing, and this whether they are wanted to form layers or not, for otherwise they would shut out the light and heat from the vines.

The hop blossoms early in July, and begins to show the seed vessels in August. It is usually ripe enough to pick early in September, and the picking should not commence till the ripeness is ascertained. This is done by observing the change in the color of the scales, from a pale yellowish, or straw color, to a light brown; the seed, also, changes its color, and has a strong, fragrant odor; while the scales have some degree of firmness, so as to be readily rubbed to pieces in the hand. When picked just before this perfect maturity takes place, however, they preserve their bright and beautiful color, and appear a little better in the market, though not quite so valuable for practical purposes as when the seed has grown to its full weight. In perfectly ripe hops which have been impregnated, a little yellow juice, or oil, forms at the bottom of the scales; and if the hops are picked as soon as this is discovered, they preserve their bright beautiful color; while if left a little longer, till the scales begin to turn brown, they acquire a little more strength and weight. The hops do not all ripen at the same time; and some growers in England are accustomed to begin the picking by selecting the ripest—beginning at the bottom of the poles, and picking at different times. But this is seldom done in this country. The picking here usually begins as soon as the scales have that bright straw color, and especially if the plantation is so large as to require some time to finish. It is an error, however, to begin too early, and before the hops are ripe, though many justify it on the plea of necessity. Picking before the hops are ripe causes the juice or sap to run where the bine is cut. The bine is said to "bleed." When this is done, the shoots of the next spring are far less vigorous and less productive. If picked before the bine has come to maturity, the tips of the roots will generally be found to turn black and decay up to the point at which the root has matured. One prominent cause of the deterioration of hops is traced to picking before they are ripe.

When the picking commences here no time is to be lost, since, in case of a rain or storm, great injury would be occasioned by bruising them. They should be picked when the weather is dry and fair, and never when the dew is on in the morning.

Great care should be taken in picking. The vines are cut from one to three feet from the ground, and the poles pulled up and laid over large boxes holding sometimes thirty or forty bushels. If the pickers are hired by the day, it matters little what sized bin is used, though it is generally large enough to enable three or four to pick into the same one; but if they are hired by the pound, as they are in many instances, the bins are divided inside into three or four compartments, one of which is allotted to each picker. Females are usually the most expert, and are more frequently employed, while one man or boy attends to do the lifting. A good picker can pick from twenty to thirty pounds a day. They are picked as free as possible from stems and leaves. All unripe or worthless hops should be thrown out. The boxes are emptied twice a day. The process of drying should commence as soon as possible after picking.

Drying.—Hops are dried, soon after being picked, in a kiln constructed for the purpose. The kiln should be about fourteen feet square at the top, twelve feet deep, and three or four feet square at the bottom. The fire should be made of maple charcoal, directly in the centre of the kiln, and it may be without the use of stoves, pipes, funnels, or any thing else; and growers of the largest experience and most careful experiment and observation confidently assert that the highest and best flavor and quality of hops cannot be perfectly preserved in any other mode. Thin joists should be laid across the top, edgewise, and laths or slats nailed to them, covered with tow cloth or hair cloth. Care should be taken not to spread the hops too deep upon this cloth covering, and not to stir them after they are spread till they are dry, or nearly so, when they may be carefully turned.

A farmer already quoted says: "Hops are dried on a kiln over a fire made of charcoal. The kiln is stoned up, in the form of a hopper to a grist mill, from seven to ten feet high, and from nine to fifteen feet across the top. Small timber or joists are placed across the top of the kiln, the smaller the better, about two or three feet apart, and narrow slats fastened to them. A thin tow cloth is drawn tightly over the slats, to receive the hops for drying."

A writer from Northfield says: "The kilns for drying are made now with an arch and hot-air chamber, under a room where the hops are spread, and hot-air pipes regulating the heat, which requires considerable experience to make them all first quality after being cured. They are then pressed with screws into bales, and are ready for the market."

This foundation wall is sometimes made of brick, and plastered inside. A furnace of stone or brick is placed in the centre, at the bottom of the front wall, with an opening through the wall to put in the coal. A funnel, winding round within the walls, three feet from the top, and out at a chimney, is sometimes used; but it is thought by many of the best growers to be quite unnecessary, and that, in fact, the simpler the contrivance is, the better. There should be sufficient draft to cause the fresh air to circulate freely within the walls. A sort of roofing is built over the kiln to shed the rain, usually with eight-feet posts, and having several doors or windows, capable of being opened to admit the air to the hops, and to allow the moisture which collects in the process of drying to pass off. The kiln may be made capable of drying from fifty to one hundred pounds of hops in twelve hours. The hops are spread from six to eight inches deep. Some recommend to build a kiln large enough to dry two hundred pounds at once; but nothing is gained, generally, by too large a kiln. If the plantation is large, it is thought best to have two or three kilns, and not try to dry too many at once. It is without doubt better to have several small kilns than one large one, and the cost of several small ones is but little more than one large one.

The kiln is often much more elaborately built, it is true, and proportioned in size to the quantity of hops to be cured and the ability of the grower. It should be so large, if there is but one, as to be capable of drying the hops very soon after being picked, and so as not to require them to accumulate faster than they can be dried. The fire is kindled before the hops are put on, though the kiln is to be slowly and gradually heated at first. The fire is commonly kept up day and night. If the hops are rusty, a little sulphur is burned under them, to bleach them and improve their appearance. This is done as soon as they have begun to heat and feel moist; but if the hops are damp when first spread on the kiln, burn the brimstone immediately. No objection is now made to hops treated in this way; indeed, their appearance is greatly improved.

Some make a practice of turning the hops as soon as the top becomes heated and the bottom part of the layer becomes crispy, allowing the fires to go down a little; but the turning should not take place till the hops are nearly dry. Much must depend on the judgment and practice of the operator. The turning is commonly done with a rake. With a steady heat, well regulated, a kiln of hops is dried in ten or twelve hours; and if the fires are kept up day and night, two kilns may be dried in twenty-four hours. The operation of drying is one of great nicety, and requires much care and attention. As soon as the drying is complete, which may be known by the brittleness of the stems and crispness of the scales, they are removed to another dark room near by and left in heaps at least twenty days, when the bagging commences. This last room is called the press room.

Baling, or Bagging.—As soon as the hops have become a little softened by moisture acquired by lying from twelve to twenty days in the heap, the process of bagging commences. The bales used here ordinarily contain about two hundred pounds. The great object in baling is to press the hops as closely as possible, to prevent the escape of the fragrance. The hops keep better for being well and closely pressed; and for this reason screws are always used—sometimes in presses made for the purpose, at others in the press of a cider mill.

The mode of baling, which was first used and suggested by Col. Jaques, and now universally adopted by the best growers in this State, is thus: One-half of the baling cloth is laid down upon the floor, and a large square box placed upon it. The hops are now put into the box, and trodden down till it is full. The screws are now applied; after which they may be raised, if necessary, and more hops put in to fill up. The other half of the cloth is now put over the top, in the same manner as the first cloth was laid to cover the lower part of the bale. The screws are applied till the pressure is sufficient, when the sides of the box, which are movable, are taken away; the bale being still under the screws, the two cloths are brought together and sewed as tight as convenient to do it. After the sewing is completed the screws may be raised, and the bale is finished.

The process of baling among the hop growers in some parts of England is still similar to the mode of baling here previous to the use of screws, though in some instances they have adopted the hydraulic presses. "A circular hole, covered by a trap door, and sufficiently large to admit the mouth of a hop bag, is made in the floor of the storage room. A few hops are tied tight in the lower corners of the bag, in order that, when full, they may be lifted and removed with ease. A hoop, rather larger than the circumference of the hole, is used to stretch out the bag, by means of hooks on the outer side of it—the inner side of the hoop, when the bag is let down into the hole, either resting on the floor, or on a frame of wood made over it. When the bag is thus stretched out and let into the opening, the feeder throws down a few shovelfuls, and the 'bagster,' descending into the bag, with flat shoes or leather socks on his feet, treads the hops regularly and carefully down, especially towards the sides. More hops are then thrown down, and closely pressed, until the bag is filled—the tighter and closer the better; for, the firmer they are packed, the longer they will keep. The hoop is then loosened, the bag is let down to the lower floor, more hops are tied into the upper corners, and it is sewed up as closely as possible—the whole operation being generally completed within an hour."

The mode of pressure with screws is so far superior to the baling described above that it is surprising that it has not been universally adopted.

Cost and Profit of Raising.—The cost of cultivating an acre of hops varies with the skill and labor applied, and of course the profits will be regulated very much by these and other circumstances. The writer from Lunenburg above quoted says: "The average yield with us is about 600 pounds per acre, and the cost, exclusive of the poles, about $55 per acre, all told. The poles are worth $2 or, $2.50 per hundred, ready for setting, and will cost, at sixteen hundred to the acre, from $32 to $40; but as good poles will last ten or twelve years, the expense per year will not be much increased."

The profit must depend entirely upon the price obtained for them, and nothing in the whole range of farming varies more in price than hops. For the last four years the price to the grower has averaged 25 cts. per pound, or perhaps somewhat more, leaving a considerable margin for profit; but for the preceding four years they were miserably low, not averaging much more than eight cents."

A farmer, writing from Northfield, says there were thirty acres of hops raised in that town the past year, yielding on an average one thousand pounds per acre, worth forty cents a pound, amounting to $400 per acre; cost per acre in that town is estimated at $40. Some growers have realized as high even as $500 per acre. These estimates are far lower than the cost of raising hops in England, where rent of land, taxes, tithes, labor of cultivating, manures, &c., are much higher than here. The cost per acre there, up to the time of picking, is estimated at about $150; while the cost of picking, drying, baling, storage, cartage, &c., is estimated at about $175 more. The cost of the kiln is often, to the English grower, not less than from $1,000 to $1,500; while the cost of a kiln here is rarely more than $75, and often less than $50, built as described above. Our growers expect ordinarily about a pound to a hill. They often get one and a half or even two pounds to the hill, making from 800 to 1,200 pounds per acre. The general average yield in England is about seven hundred pounds per acre; though, owing to many controlling influences, as diseases and bad seasons, they sometimes fall far below, and sometimes obtain much larger crops. The average of many towns in Massachusetts is not over five or six hundred pounds; but, under good cultivation, crops of one thousand pounds are not uncommon. The original cost of a hop plantation may be set down at not less than $150 or $175 per acre, including all the fixtures, poles, kilns, &c.; and the annual cost after the first year, including manure and interest on the land, and labor of every kind, at from $50 to $100 per acre.

The average price of hops for the last fifty years was 14$\frac{4}{5}$ cents per pound. During the past year "first sorts" sold as high as 45 cents per pound. The uncertainty of the foreign demand is so great as to cause fluctuations in price which cannot easily be calculated upon. This has deterred many from engaging in the cultivation of a crop on which there is so little dependence. The following table, giving the quantity of hops inspected in Massachusetts, will show these fluctuations for the last half century:—

Year.	Bales.	Pounds.	Av'ge Price.	Value.
1806, . . .	910	278,221	15	$41,733 15
1807, . . .	1,167	369,496	11	40,644 56
1808, . . .	1,071	322,976	10	32,297 60
1809, . . .	993	280,063	10	28,006 30
1810, . . .	1,124	299,500	27	80,865 00
1811, . . .	1,519	416,050	7½	31,203 75
1812, . . .	1,267	322.913	12½	40,364 12
1813, . . .	967	243,242	22	53,513 24
1814, . . .	767	179,640	25	44,910 00
1815, . . .	1,434	331,673	30	99,501 90
1816, . . .	1,336	286,374	32	91,957 68
1817, . . .	3,087	729,862	34	248,153 08
1818, . . .	2,709	616,366	14	86,291 29
1819, . . .	2,834	656,902	5	32,845 14
1820, . . .	3,555	782,663	6½	50,873 00
1821, . . .	2,659	561,063	7½	42,079 72
1822, . . .	2,810	548,709	10½	57,614 44
1823, . . .	2,936	618,444	20	123,688 80
1824, . . .	2,720	575,030	10½	60,378 15
1825, . . .	3,054	621,241	15	93,186 15
1826, . . .	2,134	409,007	15	61,351 05
1827, . . .	3,766	752,140	7	52,649 80
1828, . . .	3,312	662,334	6	39,740 04
1829, . . .	2,710	541,632	8½	46,038 72
1830, . . .	2,832	566,489	11	62,313 79
1831, . . .	2,513	505,251	10½	53,051 35
1832, . . .	2,063	400,543	23½	94,127 60
1833, . . .	3,535	698,724	16	111,795 84
1834, . . .	3,782	722,596	14	101,163 44
1835, . . .	3,479	695,800	9½	66,101 00
1836, . . .	4,461	847,590	7½	63,569 25
1837, . . .	3,354	623,648	6	37,418 88
1838, . . .	1,885	359,992	15	53.998 80
1839, . . .	1,654	283,691	15	42,553 65
1840, . . .	1,480	279,833	30	83,949 90
1841, . . .	1,607	306,099	12½	38,262 37
1842, . . .	2,395	469,231	8½	39,884 63
1843, . . .	1,636	309,294	7	21,650 58
1844, . . .	2,457	460,612	13⅘	49,932 34
1845, . . .	1,852	345,106	18	62,119 08
1846, . . .	2,381	486,899	9½	46,255 30
1847, . . .	1,760	329,185	6¾	22,143 08
1848, . . .	2,582	531,850	7	37,286 45
1849, . . .	2,170	478,910	11	52,680 10
1850, . . .	2,115	398,058	15⅓	61,376 06
1851, . . .	1,768	361,025	20	72,205 00
1852, . . .	2,111	406,568	20	81,780 18
1853, . . .	3,318	589,038	30	176,711 40
1854, . . .	4,626	812,930	26	211,361 80

[A part of this table was published in the Transactions of the State Society of New Hampshire for 1853, and from that transferred to the Agricultural Report of the Patent Office for 1853, without giving Massachusetts the credit for it. The whole of that part, down to 1828, is due exclusively to Col. Jaques, with whom the table and the whole system originated. Col. Jaques inspected, while in office, 83,095 bags, weighing 17,646,567 pounds, and worth $2,380,660.06.]

This table shows the importance of this crop as an item of material wealth, and how fluctuating the prices are. The hops inspected in Massachusetts are not all raised here. Most of those grown in Maine and Vermont are brought here for inspection. An inspection law was passed in New Hampshire in 1819, though a part of the crop grown there has usually been inspected in Massachusetts. It will be seen that the average price for 1854 is stated at 26 cents per pound. Many of the first sort sold much higher than that. Of those inspected, there were 4,043 bags marked "first sort," and weighing 711,161 pounds; 401 bags marked "second sort," and weighing 71,526 pounds; 182 bags marked "refuse," and weighing 30,243 pounds.

The profit of raising hops in Massachusetts must depend somewhat upon the extent and permanence of the foreign demand; and it must be evident that both the foreign and domestic demand for *Massachusetts* hops must depend largely upon their quality, and especially upon the standard of inspection already alluded to. Let this standard be high, let it be known that the Massachusetts brand is the best and the most reliable in the country, and the market is safe. The brand is only *prima facie* evidence of the quality, it is true; and hence the grower should take pains to raise the "first-sort" hops, if he wishes to secure honestly the "first-sort" brand, and it is a short-sighted policy which would ask for it in any other way.

Diseases.—The hop, like most plants, has its diseases and its pests, in the shape of insects, which prey upon and essentially injure it. Among the chief diseases, besides those inflicted by insects, are the rust, the blight, and the mildew. No remedy is known against these, nor is the cause well known; but they are probably owing to influences of the atmosphere not as yet very well understood. The mouldy fen, or red fen, as it is often called, causes the leaves to turn brown, and, if not checked as soon as discovered, is apt to overrun the whole plantation. It has been known to visit the same ground for a succession of years when neglected at its first appearance. The means of guarding against it are, to keep the ground in good cultivation by frequent stirring, and to eradicate every weed, and to manure well with manure from the pigsty. No well-understood remedy is known against the attacks of blight and mildew. They most frequently infect the hop in seasons when the days are hot and the nights dewless; and a frequent use of ashes is recommended as a remedy.

Besides the diseases which attack the hop, there are insects which infest it; and among others the ghost-moth, (*Hepiolus humuli,*) which lives in the root of the hop, and sometimes proves very destructive. A small green fly also infests the hop, and commits extensive depredations, sometimes even destroying much of the crop. This insect appears at the end of May, and in June. Syringing the field with tobacco water, soapsuds, &c., has sometimes been resorted to. I would suggest the use of quassia by way of experiment. This is the infusion of the bark and wood of the quassia tree, from the West Indies, of an exceedingly bitter taste. It may be obtained at most of the drug stores, and applied with the syringe with perfect safety and at small expense. A change of location once in eight or ten years seems to be the only remedy against the larvæ of some insects which attack the roots of this plant.

The hop has sometimes been called an exhausting crop. I know of no valid reason for this opinion other than the supposition, that, as the vines are large and luxuriant, they must necessarily draw upon the energies of the soil. But when we consider how large a proportion of their nourishment all plants, and particularly all plants which spread out a large surface of leaves, draw from the atmosphere, this supposition seems to have little weight. Whether exhausting or not, it is certain that after a hop plantation is discontinued on one spot, which should ordinarily be at the end of about eight or ten years from the time of setting, grass succeeds better than after most other crops. Indeed, all crops grow with the greatest luxuriance after a hop crop, and the soil is by no means exhausted for the hop itself. The necessity for a change of location arises mainly from the fact that insects are most apt to infest old grounds; and were it not for this reason, hops might be cultivated many years in succession on the same land. It is the practice of one of the largest growers with whom I am acquainted to change the location of his hop plantation every eight years; and he assures me that a plantation seeded down after the roots are removed will bear the stoutest grass for twelve years in succession, at the end of which time he cultivates it in hops again.

The constituents which are taken from the soil may be seen by the following analysis of the ash of the hop vine, including the blossom:—

In 100 parts there are of

Silica,	13.24
Chloride of sodium,	7.73
Chloride of potassium,	3.77
Soda,	0.13
Potash,	21.49
Lime,	34.79
Magnesia,	4.09
Sulphuric acid,	4.63
Phosphoric acid,	6.34
Phosphate of iron,	3.79
	100.00

The ashes of the dried hops alone, which amount to one-tenth of the whole weight, contain the following constituents, in the percentage attached to each:—

Silica,	21.5
Potash,	25.18
Lime,	15.98
Magnesia,	5.77
Salt,	7.24
Phosphate of iron,	7.45
Sulphuric acid,	5.41
Phosphoric acid,	9.8
Chloride of potassium,	1.67
Alumina, and a trace of manganese.	

It is safe to say that hops could be cultivated fifty years in succession, and still leave the land in good heart. It has been for many years one of the most profitable crops, on the whole, that have been grown in the State, averaging, under good management, more than $100 per acre, often, indeed, amounting to much more than that, and exhausting the soil less than any other.

Uses.—The fibre of the hop resembles that of hemp, and a strong, white cloth is manufactured from it, after being long steeped in water. The root, stem and leaf may be used for tanning leather, in the same manner as oak bark, sumac, &c. Hops are also extensively used as medicines, having narcotic, tonic, and diuretic properties of great value. They are often used as a sedative. The lupuline, a fine yellow powder already mentioned, contains, in 120 grains, 5 grains of tannin, 10 of extractive, 11 of bitter principle, 12 of wax, 36 of resin, and 46 of lignin. All the astringency, as well as the aroma and the bitterness, of hops, is found in the lupuline, which may be easily separated from the strobiles by sifting; and as it weighs but a sixth or eighth part of the whole, and occupies but a small part of its bulk, it may be readily transported. Whether these principles could be preserved in all their strength for any length of time, when separated from the strobiles and packed in tin cases, I do not know; but it is certainly worthy of careful experiment, since, if they could, much of the labor and expense of transporting hops might be avoided.

But by far the largest use of hops is for the preservation of various malt liquors from fermentation, and to impart to them a bitter taste. Many other plants are, or may be, used for the same purpose, but they are all thought to be inferior to the hop. From forty to fifty thousand acres of hops are cultivated in England every year, although the product is subject to a tax which, in 1844, amounted in the aggregate to £256,240 15*s.* 2¾*d.*, or about $1,281,200, on 44,513½ acres. The malt charged with duty in the same year amounted to no less than 37,187,186 bushels, returning a duty of £5,027,061.

One object of the circular given above was, to obtain some information as to the general condition of the agriculture of the Commonwealth. As might be expected, it differs very much in different localities. In some sections all the farmers derive their entire support from the farm; in others they depend, in some measure, on other occupations for a subsistence. Generally speaking, the western part of the State, including the counties of Berkshire, Hampshire, Franklin and Hampden, is more strictly agricultural than any of the eastern counties, where comparatively few devote themselves exclusively to the cultivation of the soil. In Barnstable county, which, with the exception of Suffolk and the island counties, probably contains a smaller number of farmers in proportion to its population than any other county in the State, even those who have farms very frequently prefer to plough such furrows as need no harrowing, and give much time to other pursuits; and in other eastern counties the business of shoemaking is carried on to a considerable extent, even in the farming towns, the summer farmer becoming a shoemaker in winter. Hence, in many towns of eastern Massachusetts, there is but little of the real farming spirit—the spirit of the profession; while in the western parts of the Commonwealth it is found in great strength. Comparing eastern and western Massachusetts with each other, we find that in the latter, in most places, the number of farmers has slightly increased, or at least not materially changed; while in the former the manufacturing population is larger, and the number of those who derive their entire support from the farm is comparatively small, and in many cases the aggregate number of farmers has actually decreased. Yet, on the whole, the agriculture of the State was probably never in a more flourishing condition than it is at the present day. Even those towns which return a decrease in the number of farmers frequently show an increase of agricultural products.

"The attention of persons in other pursuits has been directed to agriculture more from pleasure than profit, and the land generally is more and better cultivated," says an intelligent farmer of Essex county. But a report from Barnstable county states that none of the farmers derive their entire support from the farm, "as they are generally interested in vessels, salt-works, or some other auxiliary employment for support than the farm. But there has been an increase in agricultural products during the last ten years. Less land is cultivated, yet a better and more thorough culture prevails. While the potato and rye crops have diminished, corn and hay have increased. The hay crop, we may safely estimate, has been doubled in fifteen years, if not in ten, as some estimate. Swamp lands have been reclaimed, and uplands by cultivation and manure, have been converted into productive grass land." In Middlesex, a farmer writes: "Three-fourths of our farmers live by farming alone. The number has not increased, but most of the old farmers are improving in their modes of husbandry."

A farmer of Worcester county says: "The large farms have been cut up into smaller ones. The population has increased, the products of the land have increased, the number of cows and horses has increased; but the number of sheep and oxen has decreased."

The prices of all the products of the farm have risen so much within a few years as to induce many to turn their attention in this direction; and though the wages of the laborers, who must be employed, have increased somewhat in proportion, it is yet true that, with good management, farming will pay as high a percentage on money invested in it as any other occupation in which there is so little danger of ruinous loss taken into account.

Probably the agricultural associations have been among the most efficient instruments in raising the standard of Massachusetts agriculture. These societies are now seventeen in number. The oldest of them, the Massachusetts, founded more than sixty years ago by individuals residing in different sections of the State, has now a permanent fund of more than twenty-four thousand dollars; the youngest, the Middlesex South, has started into life since my last report was presented, and is exercising a marked and widely-felt influence.

The exhibitions held by the several societies during the last year were unusually successful. The articles exhibited were generally more numerous than on previous occasions, and the attendance was larger than it has usually been. It was a very common remark, that the societies seemed to have gained new life and vitality. These exhibitions, indeed, have become the grand holidays of the State; and the county fair is now generally regarded as the most useful and agreeable occasion of the year.

The members of the Board of Agriculture have made it a part of their duty to attend, not only the exhibitions of their own county societies, but also those of the other counties, and to report the results of their observations and inquiries to the Board. These reports for the last year are appended to this Report, and reference is respectfully made to them for further details in regard to each exhibition. This practice has already led to some valuable suggestions, and excited a useful spirit of emulation among the different societies. It must have a further good effect, both by extending the knowledge of all that is worthy of imitation, and by bringing to general notice all that should be condemned.

It has also been my intention to attend the exhibitions of each society, so far as it could be done without interference with other duties; but it has frequently happened that several of these exhibitions fell on the same day, which made it impossible for me to carry my plans into execution. The subject of fixing times for holding these festivals in the different counties is now before the Board; and it is to be hoped that the societies will find it for their interest to adopt such arrangements as may be presented for their approval.

The prosperity of the societies has continued to increase, and many new members have been added.

The aggregate amount of permanent funds now belonging to the societies is no less than .	$99,193 35
Amount received from new members, and donations, for the year, ...	6,604 10
Total amount received by the societies for the year, ...	28,829 20
Total amount offered in premiums by the societies, ...	16,281 89

This shows an increase in the aggregate amount of permanent funds during the year of $6,376.81.

The details of the finances of each society will be found in the Appendix to this Report, to which reference is respectfully made.

As may be inferred from what has already been said, the general condition of the agriculture of the State is highly gratifying. Those who, from their situation and opportunities of observation, are the most competent judges, entertain the opinion that there has been as much advance during the past year as could reasonably have been expected; and I may add, that the facts which have fallen under my own observation have led me to the same conclusion. The answers returned to the questions proposed in the circular already frequently alluded to show at the same time the deep interest taken in agricultural pursuits and the skill and general intelligence of those engaged in them. Perhaps it would be difficult to estimate too highly the importance of doing all that can be done, by judicious action on the part of the government, to keep alive and cherish an earnest desire of constant progress in this department of industry. It should be remembered that every improvement in the general system of farming, by the great increase of agricultural products and the consequent greater ease of providing the means of subsistence, must contribute materially to the comfort and happiness of every citizen of the Commonwealth, while it adds vastly to the aggregate wealth of the State. The encouragement that has hitherto been afforded by the government of Massachusetts has been fully appreciated by the farming community, and has for a long time been, and still is, producing its desired effect in increased crops and improved modes of culture. If we may judge of the future by the past, we cannot doubt that a continuance of the same liberal policy will be followed by similar good results.

CHARLES. L. FLINT,

Secretary of the Board of Agriculture.

BOSTON, January 10, 1855.

REPORTS OF COMMITTEES

APPOINTED TO VISIT THE

Exhibitions of the Agricultural Societies.

ESSEX.

The Annual Exhibition of the Essex County Agricultural Society took place at Lawrence on the 27th and 28th of September, 1854. The weather was excessively hot, the surface of the earth parched and dusty with the long-continued drought, so that neither man nor beast could show his best points, either mental or physical, as they might have done under circumstances where the elements were more kindly disposed. But there was, notwithstanding, a large concourse of people present.

The exhibition of stock was held on the Common. There were several animals of the Jersey breed imported and exhibited by George H. French, of Andover, which were fine specimens of their kind. The collection of horses, fat cattle, working oxen, steers, heifers, milch cows, bulls, swine and poultry, was not so large, nor did it possess those high qualities, that we have been led to look for in a county containing the ability to produce the best, and, at the same time, having so many persons earnestly engaged in the cause. If, upon comparison with what has been presented in former years, it is found that there was a deficiency in these prime articles of the exhibition, the cause should be ascertained and represented, so that a proper remedy may be devised.

The ploughing match was made up of four horse teams, eight single ox teams, and fourteen double ox teams. The ground was light, and could be well ploughed with ordinary skill. Persons competing in the ploughing are usually skilful in every part of the work. On porous and level land good work may be performed, with a well-trained team, with little or no skill at the handles of the plough. It is an interesting inquiry, whether the object desired is fully gained by the exercise of the men and teams on light, level land, where an apt youth of fifteen might be expected to execute the work well. Would not a more compact, uneven soil, dotted, perhaps, with hassocks, and occasionally charged with stones or roots, call out the skill of both men and teams, and afford a better field for competition than such lands as are generally selected?

The spading match was contested by seven persons, all Irishmen. One of the diggers was attended by his better half; and her deep interest in the contest, as it progressed, was witnessed with pleasure by all.

The drawing match was well performed; but the trotting horses around the course at the same time attracted by far the larger part of the spectators.

The exhibition of fruits, flowers, vegetables, domestic manufactures, &c., was held in the City Hall, and was visited by large numbers of people with evident satisfaction and profit. The walls of the hall were covered with elegant specimens of shawls from the Bay State Mills and prints from the Pacific Mills.

The Address was delivered by RICHARD S. FAY, Esq., of Lynn, and was one of the most practical and valuable that it has been our privilege to hear.

The exercises at the dinner table were of the most interesting character—the president, Moses Newell, Esq., presiding. Several gentlemen from other States, among them the Governors of New Hampshire and of Rhode Island, were present, together with members of Congress, and a large number of ladies and gentlemen from the contiguous counties.

In many particulars the show was successful; in some it was deficient. The officers were attentive and obliging, the speeches and sentiments at the table were of a useful and instructive character, and the social influences of the occasion will be felt in every part of the county.

SIMON BROWN.

MIDDLESEX SOUTH.

The Middlesex South Agricultural Society was incorporated by the Legislature of 1854, and organized on the 24th day of April last.

The first meeting of Trustees was held on the 3d day of May.

The act of incorporation embraces the towns of Framingham, Ashland, Holliston, Hopkinton, Marlboro', Natick, Newton, Sherborn, Sudbury, and Wayland, in Middlesex county; and Southboro', in Worcester county.

The society has purchased a beautiful tract of land containing five acres, lying about half a mile west of the centre village in Framingham, and within that distance of a depot on the Agricultural Branch Railroad, and it is bounded on two sides by public highways.

The society has enclosed the lot with a substantial picket fence, and furnished it with a large number of strong and convenient movable pens, and now proposes to erect a large and commodious building upon it.

William Buckminster, Esq., the president of the society, proposes to give them a lease for thirty years of a beautiful grove containing four acres. The grove lies adjoining the land of the society on one side, and the Agricultural Railroad on the other.

Passengers can be landed from the cars on one side of the grove, pass across it by a beautiful path to a gate, or entrance, to the society's grounds. The main entrance for teams is on "the Worcester turnpike." When the whole thing is completed as contemplated, it will be a most convenient and complete arrangement, and will be of great value to the society.

The property of the society, consisting of land, fixtures, and money, amounts to about $3,500. The first public exhibition of the society was held on the 26th and 27th days of September, 1854. The undersigned was present as a delegate from the Board. The first day was occupied by the committees in making their examinations—spectators not being admitted to the grounds. The second day was fair and pleasant; a vast number of people were drawn together, and all seemed well pleased. About twenty teams were entered for the ploughing match, which was well contested on a piece of ground well adapted to such a trial, and the work was well done.

A gentleman who has resided in Cuba was there with his Cuban plough and oxen, driven by a "darkie." He was dressed in the style of the planters of Cuba, and gave us a ludicrous specimen of the manner in which ploughing is done in that "gem of the sea," and an opportunity of comparing their mode of doing such work with the Yankee mode, which was amusing and instructive.

The spading match was well contested by some of the sons of the "Emerald Isle." The drawing, both with oxen and horses, was good; but in some instances there was lack of good training, and quite too much use was made of the whip, especially in backing the loads with oxen. There was a long "town team" of fine oxen from Marlboro', which took the first premium; and another from Sherborn, to which the second was awarded. Much attention has been paid to the improvement of stock by the wealthy and enterprising farmers of this vicinity; and this exhibition proves that they have been successful. The show of stock was very superior.

The Jerseys, the Ayrshires, the Durhams, the Devons, and the natives were all represented, and all were creditable to their owners. Messrs. W. G. & A. S. Lewis are doing much to improve the stock in Framingham; and it is worth the cost of a journey from any part of the State to see the fine stock of Devons owned by the president of this society. There was a good show of swine.

The geese, ducks, turkeys, and hens were there. There was a good display of vegetables, and a very fine one of fruit, especially of apples and grapes.

Wright's large tent was used—one part of it for the display of vegetables, fruit, needlework, flowers, implements of husbandry, &c., and the other part for a dining hall. A plain, practicable, common-sense address was delivered in the Baptist Church, by Isaac H. Wright, Esq., of Lexington, to a large and attentive audience.

A good dinner was provided by Mr. Smith, of Boston. The company of ladies and gentlemen at the table was quite large. After dinner, speeches were made and the premiums were announced. I noticed that several premiums were awarded for specimens of nice butter, mostly to the fair ladies of Southboro'.

This exhibition was a very successful one, and would have done credit to a much older society. This society is well constituted and favorably located. It embraces one of the best agricultural districts in the State. The land in all the towns is good; nearly all of them are convenient of access from Boston by railroad. The locations are healthy and picturesque, offering strong inducements for gentlemen who do business in the city, and wish to spend a part of their time in the country, to purchase and cultivate farms in the district. Many farms have been already so purchased; and the owners, while they are trying experiments in cultivating their farms and raising stock, instruct and benefit their neighbors. At the meetings of the society, and especially at the "cattle show," the results of their experiments are made known, and all get the benefit of them. I think this society is destined to do much good, and will furnish incontrovertible evidence that it is wise for the State sometimes, as in this case, to grant aid to societies embracing less territory than a county.

All of which is respectfully submitted by

IVERS PHILLIPS.

WORCESTER.

Being appointed a delegate on behalf the Board, I attended the Annual Cattle Show and Fair of the Worcester County Agricultural Society, held at the city of Worcester on the 27th and 28th days of September.

The days were pleasant, although quite hot and dry; and every thing went off in the usual agreeable style of this ancient society.

The ploughing match was well attended, and the large sum offered in premiums nobly contested for. A new plough, entitled the *double swivel*, which combines the side-hill with the Michigan, just got up by that worthy firm, Messrs. Ruggles & Co., attracted much attention—being drawn in one case by two oxen, and ploughing ten inches in depth; and the same size plough, in another, drawn by six oxen, and ploughing eighteen inches in depth, leaving the soil in perfect order for the seed, with merely the brush harrow passing over it lightly. The lot selected was not of the best quality to turn up and appear well; but much skill was shown by the ploughmen.

The trial of draft oxen took place immediately after. Great interest was manifested in this part of the exhibition. The cattle appeared well, and seemed to draw and back as if from choice, and not winking in continual fear of the lash, which often very much mars the show of working cattle, and what would be pleasure is turned to pity.

The cattle in the pens appeared well, considering the great drought of the season. Some fine specimens of the Jersey stock were exhibited. Mr. Paine Aldrich, of Worcester, exhibited two full-blood Jersey cows, and twenty-four pounds of superior butter made from the milk of one of them. Mr. S. Salisbury, of Worcester, also had some Jersey stock, which promises well. Mr. John Brooks, of Princeton, exhibited one fine, full-blood Ayrshire bull, and some excellent half-blood heifers. Mr. Dodge, of Sutton, exhibited some fine Devons, full blood and grades.

Mr. Robinson, of Barre, and Mr. W. S. Lincoln, of Worcester, entered some superior cattle, which contended for the State society's premium—the latter of which, being chiefly Ayrshires, obtained the first premium.

There were some fine Durham cows belonging to Mr. Bacon, of Barre; also some promising young stock. Mr. J. A. Reed and Mr. W. W. Watson each exhibited a fine dairy cow.

Judging from the specimens offered, too little attention is bestowed in this county upon swine. With this exception, Worcester appears ahead of some other societies in stock.

The cavalcade and horse show seemed the great object of attraction to many of the *fast young men;* and truly a more elegant display of horses it has rarely been my lot to witness. With the exception of one or two slight accidents from collision while trying their speed, all went off well; but the society's grounds are hardly large enough to admit so many vehicles and enjoy the race-course at the same time.

The society had just completed a beautiful building, about fifty-five by one hundred feet, in the lower floor of which the manufactured and fancy articles were exhibited. Above, the dinner was provided. This, having been disposed of, was followed by an address by his Excellency Governor Washburn. Every word seemed to the point—brief, able, and highly interesting.

The only objection to the otherwise perfect arrangement was the absence from the table of the wives and daughters of the members of the society, to whom much of the success of our farmers is owing; and I must protest against the lords of creation appropriating all the credit of our shows to themselves, while all the in-door manufactures are prepared by female hands, and by their patient toil brought before the public.

One fact is worthy of notice. The gathering was uncommonly large; the utmost order prevailed throughout the city; hardly a case of intemperance or rowdyism (so common at public gatherings and horse shows) met my eye. Yet no police were visible, or wanted, except the officers upon the show ground; and the exhibition of well-behaved, steady New England farmers and mechanics by far exceeded the fine display of the society's products.

Respectfully submitted,

WM. G. LEWIS.

WORCESTER WEST.

The subscriber, by request of this Board, visited the Cattle Show at Barre in September last, and would report: That the society is a new one; but in the dairy, in the exhibition of butter and cheese, it could not be excelled in any county in the State. The cows generally appeared to be a grade of Durham and native. The lands appeared in good farming order; the fields large, clean, and well enclosed by stone walls; the barns large, and well planned. The cattle seemed to have suffered by the severe drought. The working oxen were not so well matched or disciplined as in some other places.

The society is located in the most fertile part of the Commonwealth, and, with the intelligent farmers concerned in the society, warrants a belief that it will soon rank with our best.

B. V. French.

HAMPDEN.

The undersigned, as appointed by this Board, attended the Show of the Hampden County Agricultural Society on the 27th and 28th of September.

The show of cattle was decidedly in advance of any before held by that Society, so far as its former shows have been observed by your delegate. More of the Durham blood appears to have been infused; and the cattle exhibited were generally of a finer character and in better order than could reasonably have been expected after the severe drought of the preceding summer.

The exhibition of fruit showed progress in that department; and the show of vegetables was such as could hardly be expected, even in the valley of the Connecticut, except in that part about Springfield.

All the arrangements of the exhibition were such as to meet the approbation of your delegate. The Hampden Society is doing well. This brief statement is respectfully submitted.

J. A. Nash.

BERKSHIRE.

By an appointment of the State Board of Agriculture, I was present at Pittsfield on the 4th and 5th days of October.

It was the forty-fourth anniversary of one of the oldest agricultural societies in the State.

The morning of the fourth was dull and rainy. The farmers came in slowly, and made their entries still more slowly. At eleven o'clock there were but few specimens on the ground; but towards noon the clouds disappeared, the sun came forth, and the effect was soon visible in every department of the exhibition. A visit to the cattle ground at two o'clock showed as fine a collection of animals as it was ever my good fortune to behold. The show of fat cattle was good, and the working oxen I have never seen excelled.

I would mention in particular those owned by Mr. Willis, of Pittsfield, and Mr. Andrews, of New Marlboro'; also a pair of three-year-old steers, owned by the last-named gentlemen, all of which were of large size, fine form, and superior quality—the oxen named being but four years old, and weighing 4,000 pounds to the pair.

The exhibition of cows was large, and did credit to the society. There was a respectable show of sheep.

The swine and poultry were by no means inferior. The exhibition in the hall was uncommonly interesting. The quantity and variety of domestic and fancy articles displayed the skill and ingenuity of the ladies.

The show of fruit was not large. It consisted almost entirely of apples. Fifty-six varieties, presented by Mr. Tuttle, struck me as being particularly fine. The twenty-ounce apple exceeded in weight the name it bears.

The display of horses was good, some of them being very fine.

The second day commenced with the ploughing. Twenty horse teams and six ox teams entered into the contest, and did some very good ploughing.

Being obliged to leave before the close, I did not hear the address delivered by Hon. Increase Sumner, nor see the awards of premiums, consisting of silver plate, which will long be kept as a memorial of the Berkshire Agricultural Society.

JOSEPH SMITH.

BRISTOL.

The undersigned, agreeably to the appointment of the State Board of Agriculture, had the pleasure of attending the Cattle Show and Exhibition of the Bristol County Agricultural Society on the 27th and 28th days of September last; and he now takes great satisfaction in reporting the results of his observation.

The Show took place in the city of New Bedford, and was conducted under the joint direction of the Bristol County Agricultural Society and the New Bedford Horticultural Society, reflecting equal credit on both associations. It occupied two days, both of which were fortunately among the loveliest days of the season, and every way auspicious to the success of the occasion.

The first day was opened by the customary ploughing match, which was witnessed by a vast concourse of spectators, and which could hardly have been exceeded in any part of the Commonwealth for the depth and regularity of the furrows, the thoroughness with which the soil was pulverized, and the despatch with which the labor was accomplished.

A trial of draught oxen soon followed, which was well contested, and of scarcely inferior interest.

This was succeeded by a display of horses of every variety—some of them under the saddle, some of them drawing the light gig or buggy, and some of them harnessed in teams to the ponderous truck or wagon, and all moving in grand procession over the noble new road which has recently been constructed by the city of New Bedford along the borders of her beautiful harbor.

Meantime the pens were filled with stock of every sort, among which were many specimens of the choicest quality. A grade Durham, or short-horn cow, of remarkable size and beauty, and which was stated to have given the almost incredible quantity of nine thousand quarts of milk in sixteen months, attracted much notice.

Three separate Halls of exhibition were also opened on the occasion—one of them containing a show of domestic and household manufactures; another assigned to the display of vegetables, the products of the dairy, and the implements of husbandry; and a third and larger hall devoted exclusively to fruits and flowers.

Nothing could have been richer or more exquisite than this last display. It was particularly remarkable for the great variety and excellence of the apples, the staple fruit of our country, and hardly second in importance and value to any production of the soil.

In the Hall of Manufactures were exhibited several samples of American linens from the factory at Fall River, which gave the highest promise of future success in an article for which we have heretofore been wholly dependent on foreign labor.

On the second day of the exhibition an able and interesting address was delivered by the Hon. J. W. Miller, of Morristown, New Jersey; after which the premiums were announced at a most agreeable entertainment, which was graced by the presence of ladies, and enlivened by wit, poetry, and eloquence.

Robt. C. Winthrop.

BARNSTABLE.

The Annual Exhibition and Cattle Show of the Barnstable County Agricultural Society were holden at Barnstable on the 11th of October, 1854. The day was mild, clear, and serene. The streets were filled with a larger multitude of people than I have ever seen there before,—men, women, and children,—all wearing that aspect characteristic of the people of Massachusetts on "cattle-show" day—all manifesting a disposition to be pleased, and to please others; to be happy, and to make others so.

The first part of the exhibition which I saw was the ploughing match. Only three ploughs appeared upon the field, each drawn by a single pair of oxen, without a driver. Of the ploughs, one was Ruggles, Nourse & Mason's; one Prouty & Mears's; and the other of a make not familiar to me, and its style of work was such as not to make me desire to remember it. The land was light and sandy—not requiring great skill to plough it. The required depth was seven inches. The work was performed in a creditable manner, both as to time and execution. It is to be regretted that so few competitors appeared, and to be hoped that this part of the exhibition will hereafter become in Barnstable county what it is in other counties—one of the most exciting and attractive features of the exhibition.

My attention was next called to the show of animals. The pens were excellently arranged upon a convenient lot; but I noticed one great omission—no label or description of the animals was affixed to the pens, with a single exception, so that one was left to guess as to their age, breed, and qualities. I saw upon the ground eight yoke of oxen—some of which I judged to be working oxen, and some for beef. There were also about forty head of cows, bulls, heifers, steers, and calves. I noticed but one milch cow; and I think the committee reported that only one was exhibited. The animals generally were of respectable quality—probably mostly of native breed, with an occasional accidental cross. I saw but two apparently thorough-bred animals—a two-year old Devon bull and heifer, from the stock of B. V. French, of Braintree. There were also on exhibition fourteen horses, mares, and colts—some of good quality; also a few sheep, swine, and fowls.

The exhibition of agricultural products, manufactures, and fancy articles was in the Court House. In the court room, upon the tables and desk, were exhibited a few articles from the manufacturers and mechanics of the county, numerous articles of the taste and handiwork of the ladies, and several beautiful bouquets; but, from the unfitness of the tables of a court room for their display, the articles were imperfectly exhibited; and justice was not done, either to the exhibitors or the spectators.

The butter, cheese, bread, &c., were placed in a small and crowded room, in the rear of the court room. They deserved a better fate. Of bread, white and brown, the exhibition was as good and extensive as I have seen any where. The samples of butter and cheese were good, but not numerous.

Fruits, vegetables, &c., were exhibited in the grand jury room, mostly upon the floor, in baskets or otherwise, with narrow space for spectators, and no convenient opportunity for examination. There were excellent specimens of several varieties of apples and pears, worthy of a place in any exhibition; also of Isabella and Catawba grapes.

The cranberries, corn, potatoes, sweet potatoes, (of which one sample was exhibited,) beets, carrots, onions, and other agricultural products, though not in great abundance, were of excellent quality, and would compare favorably with any which I have seen at any exhibition. The drawing match I had no opportunity to witness.

A good dinner, graced by the presence of a few ladies, was partaken of by about one hundred and thirty persons at Eldredge's Hotel. It was what may be called a business dinner, as the address was to follow within three quarters of an hour after taking our seats at the table.

At two o'clock an address was delivered by Hon. C. T.

Russell, which was listened to with great interest by a crowded and attentive audience. After the address the Society again met, and reports of committees were made and premiums awarded.

I attended the cattle show in the same county a few years ago, and, except in the ploughing match, a decided improvement was observable at this time. The interest of the people in agriculture and the agricultural exhibition is increasing in that county as elsewhere. The farmers of Barnstable county have the ability to make the annual agricultural exhibition *the festival* of the county. The inhabitants of Cape Cod are more devoted to ploughing the sea than the land; but they have much excellent tillage land; and if they will bring to the show what they can, they have the power in that county to make a very attractive exhibition in agricultural products, manufactures, and mechanic arts, fruits, flowers, and especially in domestic manufactures.

I would respectfully notice one or two matters in which improvement is required.

The effect of the exhibition was frittered away by dividing the articles into three separate rooms, no one of which was suitable for the purpose. The articles exhibited this year, if concentrated in one hall and properly displayed, would have made an effective and gratifying show. It is to be hoped that in future that subject will receive attention, and that greater justice will be done to the society, contributors, and spectators.

As the exhibition was held only one day, there was much hurry, and some confusion, as has been the experience elsewhere. Much of the evil and inconvenience would have been avoided if members of committees had been promptly at their posts and attended faithfully to their duties. The society, judiciously as it seems to me, decided to hold the exhibition next year through two days.

Respectfully submitted,

J. H. W. Page.

FOREST TREES.

[The following communication, on the subject of Forest Trees, has been submitted to the Board of Agriculture by the Hon. John C. Gray.]

If this country has been highly distinguished in any respect by the bounty of Nature, it is in the number and variety of its trees. If we were compelled to describe the territory of the United States in a few words, we could not do it more philosophically than in the language of Volney, who represents it as one vast forest, diversified occasionally by cultivated intervals. With the exception of some of the prairies of the valley of the Mississippi, I am not aware that there is any considerable section within our present States which was originally destitute of wood. Beyond the immediate vicinity of our large towns we find every stream thickly shaded by overhanging branches, and every mountain, with the exception of a few of the highest, covered with a leafy screen of all varieties of shade, from its base to its summit.

The progress of population and improvement, astonishing as it is, has been insufficient to efface to any extent this distinguishing feature of American scenery; and the striking picture drawn by one of our own poets, of the native aspect of the country, has not yet lost its general resemblance:—

> "Then all this youthful paradise around,
> And all the broad and boundless mainland, lay
> Cooled by the interminable wood, that frowned
> O'er mount and vale, where never summer ray
> Glanced till the strong tornado broke its way
> Through the gray giants of the sylvan wild;
> Yet many a sheltered glade, with blossoms gay,
> Beneath the showering sky and sunshine mild,
> Within the shaggy arms of that dark forest smiled."

The extent of our woods is not more remarkable than the various kinds of trees which compose them. It is stated by Michaux, that in the United States there are one hundred and forty species of forest trees which attain a greater height than thirty feet, while in France there are only eighteen of the same description. Of the solid advantages which we derive from this abundant variety I shall say nothing at present. It needs only a cursory glance to perceive how much it enhances the beauty of our natural scenery. "I was never tired," says an intelligent English traveller, "of the forest scenery of America, although I passed through it from day to day. The endless diversity of foliage always prevents it from being monotonous."

The variety of shape and tints in their green foliage is not, however, the chief distinction of our woods over those of the old world; they surpass them far more in the rich and various hues of their autumnal leaves. This, if not the most striking, is certainly the most unique feature of an American landscape. What natural scenery can surpass in beauty that presented by one of our forests in one of the brilliant and serene afternoons of our Indian summer, when the trees are clothed with a tapestry of the richest gold, and purple, and scarlet, resembling, and almost rivalling, the most gorgeous hues of our autumnal sunsets?

It is not the mere variety of coloring which is the peculiar characteristic of our fading leaves; this variety exists also in European woods, though to a less extent; for, as has been already stated, their catalogue of forest trees is far more scanty than ours. But their leaves, in divesting themselves of their summer green, lay aside also all their brilliancy, and assume a complexion proverbially dull and faded. It is a peculiarity, on the contrary, of many of our forest trees, that their leaves, in changing their hue, lose little or nothing of their brightness, and that their autumnal dress is not only far richer, but scarcely less lively, than their freshest June liveries. This circumstance is generally ascribed to some peculiarity in our climate, and especially to the manner in which the cold weather makes its first approaches. But this manner varies almost every year, and yet our trees exhibit annually the same splendid changes. For this, as well as for other reasons, we are inclined to think that the peculiarity is not in the climate, but in the trees themselves, and that it is one of those shades of difference which distinguish, in almost every instance, the plants of America from their kindred species in the old world. A transplanted American maple, for instance, would probably undergo the same splendid transmutations in an English park as in its native forest. This supposition has been formed on much consideration, and is, besides, sanctioned by the opinion of an eminent English botanist who has resided in this country for several years.

I have observed that scarcely any considerable portion of this country is entirely devoid of magnificent forest trees. But whatever striking instances of the truth of this remark we may find in New England, and more especially in Vermont and Maine, it must be admitted that he who would behold sylvan scenery on its most magnificent scale should cross the Alleghanies and visit the great valley of the Mississippi. Here he will find vast tracts into which the axe of the woodman has never penetrated. These are covered with a coat of vegetable mould, exceeding in many places the depths of our richest soils. We find accordingly a luxuriance of vegetation to which nothing in our own State affords a parallel. It is true that with us there is here and there a gigantic elm or buttonwood which might take rank with the noblest specimens of western growth; but in travelling in Kentucky or Indiana we find trees at every step of six or seven feet in diameter; so that most of our woods, compared as a whole with theirs, seem to be but the product of yesterday. Every plant appears to partake of this gigantic character. Thus the wild grape vine, which with us rarely grows larger than a stout walking stick, in our Western States sometimes surpasses in diameter the body of a full-grown man.

The majesty of our western forests is not a little increased by the circumstance that they are generally free from undergrowth. The banks of the Upper Mississippi especially are covered with trees of the largest size, shooting up to a lofty height, from the smooth levels or gentle swells of the green prairies beneath, like the oaks in the finest parks of England. So tastefully are these trees grouped by the hand of Nature, and so entirely clear is the green prairie grass from undergrowth, that the spectator can hardly avoid imagining that he is looking, not at a new country, but at one which was once peopled by a highly-cultivated community, who have been long since swept away with every vestige of their wealth and refinement except their stately groves and verdant lawns.

I have thus far spoken of our forests merely as a predominant and magnificent feature of American scenery; but it is scarcely necessary to say that they have other claims to our attention of a far more solid character. It is to our forests that we have been indebted for two hundred years for our fuel and our shelter. How much of the progress of New England, at least since its first settlement by our forefathers, has been owing to the liberality of Nature in this particular! Whatever were the calamities, in other respects, of those much-enduring men, they were at least exempted from the extreme and probably fatal suffering to which they would have been subjected in a thinly-wooded region. Had the aborigines possessed that determined and unsparing hostility to large trees which seems to have actuated many of their successors, it is probable that these northern settlements would never have had a being.

One of the most remarkable of the forest trees of the United States is the white pine—called in England the Weymouth pine, and known by botanists as the *Pinus strobus.* This tree must be familiar to many of our readers in various ways, as it abounds in our neighborhood, and as its branches are more frequently employed than those of any other tree for the decoration of our Catholic and Episcopal churches. It may be distinguished at first sight from every other evergreen growing in this State by the lightness and delicacy of its foliage, as well as by its less formal mode of growth. On a closer view it is found to differ from all our other New England pines or spruces in being what is called five-leaved—that is, in putting forth its leaves in sheaths, each containing five.

This tree is certainly the most majestic in the country when it reaches its full growth in our forests. Though it does not spread in a graceful sheaf like the elm, nor rise up in a regular spire like the fir, it more than compensates for the want of these beauties by its loftiness. None of the productions of the Atlantic States approach it in this particular. It is sometimes said to reach the height of more than two hundred feet; and Michaux actually measured one which had been felled, and which exceeded one hundred and fifty; and the trunk is singularly smooth and straight.

A magnificent appearance is far from its chief recommendation. We know not that we in New England are equally indebted to any other production of our forests, not even to the oak. Michaux remarks that throughout the Northern States, except in the larger capitals, seven-tenths of the houses are of wood; of which seven-tenths, three quarters, estimated at half a million, (this estimate was made nearly fifty years ago,) are of white pine.

In the first part of this statement there is a mistake quite remarkable in a writer of such singular research and accuracy. If we except the larger capitals, we ought to say, not that seven-tenths, but nine-tenths, at least, of houses in the northern States are wooden; indeed, the number of those of a different description may be considered as too small to deserve notice; and of these nine-tenths, the great mass are of white pine. This tree owes its selection for this most important purpose to one quality in particular—the small expense of labor at which it can be fashioned and put together.

While it is more durable and better able to bear exposure to the fierce temperature and sudden changes of our climate than any other pine which abounds in New England, it is also lighter, softer, and more free from knots. In favorable situations the diameter of the trunk varies from three to seven feet; and thus it furnishes planks of ample dimensions for building. This tree has also one important quality, in common with the locust, which is denied to many other of our best timber trees: we mean the great proportion which the heart, or perfect wood, bears even in young trees to the alburnum, or sapwood, being not less than eleven to one in trees of a foot in diameter. In all timber, after felling, it is the sapwood which is the first to decay, and which is as unfit for any useful purpose as the unripened products of Nature generally. Hence it is an important element in the value of the white pine that it ripens its wood at so early a period.

It is true, after all, that in point of durability, when freely exposed to the elements or when set in the ground, its timber cannot compete with many of the harder woods; but, if well seasoned and kept carefully painted, it will endure for centuries without any symptoms of decay, as we find attested by many wooden houses, more especially in our large towns.

Where entirely covered, it seems to be incorruptible. But were its durability less, the other qualities to which we have adverted—namely, its lightness and softness—would form a most liberal equivalent.

It is not easy to estimate how much the rapid advancement of New England may have been owing to the abundance of this valuable tree. The importance of shelter is a point which it requires few lessons from our winter climate to set forth; and by no tree with which we are acquainted could this want be supplied so rapidly and easily as by the white pine. At the value which human labor has always maintained among us, the difference of expense to New England which would have resulted from the general employment of the oak, for instance, instead of the pine, for our houses, would be enormous. In many parts of the valley of the Mississippi, this pine, as well as almost every other species of pine, is exceedingly rare.

The settlers are in consequence obliged to substitute the oak, both for their houses and their furniture. Their dwellings (we speak of the new settlers) are generally of oak, filled in with earth, and are quite inferior, both in appearance and comfort, to those which we find in the newly-cleared lands of Maine. We are scarcely less indebted to the white pine for our commercial and naval than for our civil architecture. It is this tree which gives us, not indeed the frames, but the masts, of our vessels, for which it is admirably fitted, by the degree in which it combines the qualities of durability and lightness, as well as by the straightness of its trunk.

Its place for this purpose, in the Northern and Middle States, could hardly be supplied. During our colonial existence its value was fully appreciated by the mother country; and, more than one hundred years ago, some statutes were passed restricting the cutting of trees proper for masts.

There is no evidence, however, that these statutes were ever enforced; and, however useful in their design, they would interfere quite too much with private liberty to render their renewal desirable, so far as respects the land of individuals. But it is certainly well worthy the consideration of the legislatures of many of our States, whether effectual measures should not be taken for the preservation, and perhaps the propagation, of valuable timber on the public lands within their jurisdiction.

The fame of the white pine has long since extended to Europe, principally by means of the stocks which have been exported to England to supply in part her immense demand for masts and spars.

The living tree has also been introduced into that country, but is not highly appreciated, and we have found no English writer who does it full justice. The truth is, however, that the climate of England is not fitted to its development. The limits within which it flourishes in this country are the 43d and 47th degrees of latitude. Now, no part of the Island of Great Britain has a climate which answers to that of this region. The northern extremity of Scotland, which lies in about the 58th or 59th degree of latitude, is visited with winters far less rigorous than the great majority of our own. Besides, there are few situations in Great Britain which furnish the soil in which this tree chiefly delights. The most magnificent specimens of the white pine in this country are found in the depths of our forests, in a virgin soil, covered with the accumulated mould of centuries, and above all on the banks of rivers, or in the beds of large cedar swamps.

In pleasure grounds it seldom rises to its greatest height, or at least requires a longer time to do so than has yet been allowed in any instance within my knowledge. It grows, however, with considerable rapidity, and soon acquires a loftiness and bulk equal to that of most cultivated trees; and its highly-polished bark, and light, silvery foliage, render it, from the time it springs from the soil, a desirable accession to every shrubbery.

The next of our principal forest trees which I shall notice is the white oak. The general appearance of oaks is more familiar to us of this region than that of any other class of forest trees except the elm and the plane tree. The oak is far less lofty than the pine, and has no pretensions to the elegance of the elm; but, as an emblem of robust vigor, it stands, both in the old and new world, at the head of all the sons of the forest. Such has been its character in all ages. It is also supposed to be a tree of slower growth and longer life than any other; though its superiority in this last respect over the chestnut is far from incontestable. The useful qualities of its wood have also been appreciated from time immemorial in every country in the temperate zone. For these reasons, probably, the oak has been regarded with a degree of veneration from the earliest ages of mankind.

The first sepulchral monument on record was an oak tree.* But in no country has it been more valued, more honored or cherished, than in that of our forefathers; and with abundant reason, as forming the chief material of those wooden walls to which they have more than once owed their national existence. Hence it has long been recommended to us by many historical and poetical associations; and the achievements of our gallant navy, as well as the vast benefits which we have derived from our commerce, have given it a new and far stronger claim to our veneration.

Of all the species of this genus which grow in the latitude of New England, the most valued is the white oak, (*Quercus alba.*) This is easily distinguished from every other tree of the same kind in our vicinity by the whiteness of its bark, and by the persisting, or holding on, of a few of the dried leaves in the winter season. Its leaves are also without prickles or bristles at the end of their lobes—a quality in which it agrees with no large oak in this State except the swamp white oak, (*Quercus prinus discolor.*) It bears a greater analogy than any other oak to the celebrated oak of England—European white oak, or *Quercus pedunculata.* Which of the two trees furnishes the finer timber, is a question which has been investigated with great care. It is stated by high authority that the wood of the American white oak is lighter, more elastic, and more flexible than that of the

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* Gen. xxxv. 8.—"But Deborah, Rebekah's nurse, died, and she was buried beneath Bethel, under an oak; and the name of it was called Allon-bachuth"—i. e., *the oak of weeping.*

English, but that it is, on the whole, weaker and less durable; and this opinion is sanctioned by a large number of English writers. The question has not been fully settled by facts; for some of those who have expressed such an opinion in strong terms conclude by admitting that, after all, American vessels might be no less durable than English, were their timber equally well seasoned.

The white oak was largely employed in the frame of our favorite frigate, which was built nearly sixty years ago. In the course of the very thorough repair to which that vessel was subjected about fifteen years since, many of the white oak timbers of her frame were found in excellent condition; and it was stated on the best authority that in several instances timbers of this description were sound, while others by their side, of the southern live oak, had decayed.

Now, the superiority of the live oak, in point of durability, over the oak of any other country has never yet been questioned. The English oak, however, if really superior, could be easily multiplied in our Northern and Middle States. It has been already introduced, and some fine specimens of more than twenty years' growth may be seen in our neighborhood.

The timber generally selected for ship building is what is called the pasture oak. This is greatly preferred to that which grows in crowded forests, where the trees, from their vicinity to each other, are robbed of much of the nutriment which they derive from the soil, as well as of the genial influence of the sun and air. Hence the building of a single large vessel requires the timber of many acres; and as the white oak is constantly felled in great quantities, both for home consumption and for exportation, the period cannot be distant when serious difficulty will be experienced in procuring a supply of this valuable wood.

In this connection it may be proper to make one or two remarks on the felling of trees. It is generally agreed that the durability of timber depends materially on the season when this operation is performed; but what that season is, is a question on which directly opposite opinions are held by the ablest writers. The principal cause of the decay of wood of all descriptions is thought to be the sap which remains after felling; and hence the desired object is, to procure timber as free as possible from this ingredient. To this end it has been recommended to fell the tree in the winter season, as it is then deemed to contain the smallest quantity of sap; and such, we believe, is the general practice.

This doctrine, however, was opposed with great ability by the late Colonel Pickering, who states, and with truth, that trees are not devoid of sap in winter, but that it exists in abundance, though greatly thickened by the cold. He maintains, therefore, that it is much more difficult to expel than in summer, when in a more liquid form, and that the proper time for felling the tree is, not when it contains the least sap, but when the sap which it does contain may most easily escape or be expelled.

This opinion certainly seems to be the better one; though the winter season is so much more convenient on many accounts than any other for the procuring of timber that the old practice will probably maintain its ground. But whatever may be thought of the correctness of Colonel Pickering's theory, no one will question the propriety of the suggestion with which he concludes his remarks, that the point should be determined by actual experiments, under the direction of our navy board, or some other high scientific authority.

Besides the white oak, there are four other species in our vicinity which grow to a large size. Of these, the most valuable are the swamp white and the black oak. The swamp white oak is not abundant, and grows only in moist soils. It has been less used than the white oak, partly on account of its rarity; but its timber is heavier, and it is thought that it may be found, on accurate examination, to be superior.

The black oak is valued, not for its timber, which is of an inferior quality, but for its bark; for it is this which furnishes the quercitron, so much used for imparting a beautiful yellow dye to wool, paper, &c.*

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* In a communication in the fourth volume of "The New England Farmer," made several years ago by one of our most distinguished fellow-citizens, mention is made of the trunks of several large oaks in Dorchester, in one of which he had counted upwards of two hundred annual rings.

The largest oak, and indeed the largest tree, which I have seen in this country, Next to the pines and oaks, there seems to be no tree in the country of more extensive celebrity than the sugar maple. The extraordinary neatness of its appearance, and the beauty of its foliage, which in summer is of the liveliest green, and in the autumn assumes the richest and most glowing red, are sufficient to recommend it as a beautiful ornament in our gardens and avenues. The branches are disposed with much regularity, though without stiffness, and so arranged that their usual outline is an elegant oval. It is to this tree we are chiefly indebted for the beautiful curled and bird's-eye maple employed in cabinet work, which rivals, if it be not admitted to surpass, in brilliancy and richness, the finest woods of tropical climates. But the sugar maple derives its chief reputation, as well as its name, from the qualities of its sap. A large portion of the sugar used in many parts of the country, the western districts of Vermont and New York, for instance, is derived from the maple. Michaux remarked, nearly fifty years since, that at least ten millions of pounds of this sugar were then annually made in the United States. This quantity is far less than might be procured from the same source in case of necessity. According to Dr. Rush, the northern part of New York and Pennsylvania alone contained at the same period thirty millions of sugar maple trees; and if we suppose each tree to yield on an average from two to four pounds of sugar annually, the product would go far towards supplying the whole consumption of the country.

The maple sugar can be made of a quality equal to the best imported. It is, however, in a brown state that it is generally used; and, except in the districts where it is produced, it

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is a white oak which I saw, in 1836, on the estate of the late James Wadsworth, Esq., of Genesee. The tree is from twenty-four to twenty-seven feet in circumference at the smallest part of the trunk. Its age cannot be less than five hundred years; and it must, therefore, have been a majestic tree at the time when Columbus discovered the western world. It appeared to be in a vigorous and healthy condition, and bore on its exterior no marks whatever of decay. It is by no means improbable that this tree exceeds in size many, both in Europe and elsewhere, which are recorded as of greater diameter; for, in the measurement of large trees, it is of great importance to ascertain at what part of the trunk the measurement was taken. Every one must have remarked the difference between the bulk of such trees at the surface of the ground and at a few feet above.

is less agreeable to the palate of consumers generally than the product of the cane. To manufacture it requires a great expense, not only of labor, but of fuel; and hence it probably cannot be sold at a distance for a price which will enable it to compete with the imported article.

The sap of the tree, or maple juice, as it is called, is greedily coveted by wild and domestic animals, who break through enclosures for the sake of obtaining it, and is generally an agreeable and wholesome beverage. I have been informed, however, of one instance in which it proved to be of a highly intoxicating quality. This circumstance occurred about thirty years since, in the western part of the State of New York. All the sap procured from the maple trees of an extensive district was found to have undergone a vinous fermentation, and children who drank it freely were in some cases rendered delirious for two or three days. I have heard of no other instance of this phenomenon, nor have I learned that any probable explanation has been given of its cause.

The last of our forest trees which we shall notice is one of which we need say but little, either in the way of description or recommendation; we mean our American elm. In a strictly economical point of view this tree is of little value, as neither its wood nor its bark is employed to a great extent in the useful arts. It is subject to the disadvantage of being attacked by the canker worm, and is one of the first trees to shed its foliage in the autumn. It is a tree, also, which proves rather a troublesome inmate in small gardens and enclosures, as it spreads its roots far and wide, and frequently protrudes them above the surface of the ground, so that it completely monopolizes a large extent of soil. But where a proper space can be allotted to it, there is no tree which rivals it in grace and majesty. Michaux pronounces it to be decidedly the most magnificent vegetable production of the temperate zone. Few who have seen this tree in favorable situations will question its right to this preëminence.

Every one must have noticed the noble elms standing singly on the commons of so many of our villages. These are generally the relics of our original forests; and the care with which they are now preserved and protected furnishes a striking and gratifying evidence of an improving taste for sylvan scenery.

I have thus spoken of a very few of our native forest trees. It might be gratifying to speak also of several of those of the old world; but to do so would extend this essay beyond the proper limits.

I have already observed that the list of European forest trees is far more scanty than ours, and there are very few of them which would be a valuable accession to our botanical treasures. Many of the most important classes, or genera, of forest trees are common to both continents, such as the oak, ash, elm, &c.

Those trees of the old world and the new which bear the same name generally resemble each other to a great degree; but, in almost every instance, the resemblance stops short of complete exactness. Thus we find that the elms, willows, and larches of Europe and America, though manifestly belonging to the same class of vegetable productions, differ from each other materially, either in their size, their beauty, or the value of their timber.

This seems merely an application of the general law of Nature, which leads her to avoid, in all her productions, any thing like mathematical resemblance—a rule of which we have a familiar proof in the fact that no two leaves can be found on any tree which do not manifestly differ in shape and size. There is, however, one tree of the old world which has been rendered so familiar to our imaginations by early associations, both of a poetical and sacred character, that I cannot forbear to speak of it more particularly; I mean the cedar of Lebanon. It is classed with the larches—a place to which it is entitled, among other reasons, by the shape and size of its leaves, and the manner in which they are disposed on its branches. These branches extend themselves to an uncommonly wide distance, are arranged in stages one above another, and are horizontal, or rather slightly inclining to the earth—and thus form an irregular penthouse.

In the opinion of the best judges, this tree owes its beauty partly to this arrangement of its limbs, and partly to the density and the deep green of its foliage. But it is only in its native mountains that we can find any magnificent specimens of this renowned plant; and of these specimens the number is small, and constantly diminishing. We are told that, in 1789, there were only seven cedars on Mount Lebanon of a very large size, one or two of which were found by measurement to be thirty feet in circumference. These noble trees are probably the growth of several centuries; but we should give ourselves up quite too far to the guidance of our fancies if we supposed, as many writers seem inclined to do, that they were coeval with the days of Solomon.

The whole number of cedars on this spot, large and small, is about a hundred; and they are said to be annually honored by a pompous religious ceremony, attended by several thousand devotees. But however magnificent the appearance of this tree, and however numerous and interesting the associations with which it is connected, we are compelled, by the testimony of the best authorities, to deny to it some of the qualities with which it has long been invested in popular estimation. It has been called, for instance, a lofty tree. To this title it has no pretension, as we have no well-authenticated account of its exceeding the height of a hundred feet, and it seldom rises to much more than half that elevation.

There is also a popular impression that its wood is distinguished by durability. This opinion is derived partly from the representations of the ancients,* and partly from the fact that the timber of its namesakes, the cedars of our own country, is remarkable for this quality.

According to the great majority of botanists, the wood of the cedar of Lebanon is an inferior kind of deal, resembling some descriptions of pine, but less durable. For the purposes of timber, therefore, this tree is unworthy of cultivation. Whether its beauty and its historical and poetical celebrity are sufficient recommendations for its introduction, is a question unfortunately of little interest to us, as there is probably no part of the United States where it could be raised to advantage in the open air. It is true that in its native locality it is subjected to a high degree of cold, as it grows immediately below the covering of eternal snow which rests on the summit of Lebanon. But the atmosphere even of England is unsuited to its full development, on account of its want of sufficient moisture; and therefore it must be entirely out of the question to suppose that it could flourish in our proverbially bright and dry climate. It seems to partake of the nature of what are called alpine plants; and every gardener knows that such plants are of all others the most difficult to rear, and that it is next to impossible to supply them with a proper equivalent for the constant shade and moisture which they enjoy on the cloud-capped tops of their native hills.

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* It is well known that the ancients were far from accurate in their botanical knowledge, and that, even in our day, nothing is more common or more vexatious than the great confusion and numerous mistakes which result from describing vegetable productions merely by their popular names.

There is much controversy among botanists whether the name of cedar was not often given by ancient writers to some species of pine or cypress.

It was my intention to have submitted in this place a few practical hints on the subject of planting; but, as complete directions may be found in books easily accessible, I have concluded rather to give an account of the mode in which the business of procuring timber and boards, commonly called lumbering, or logging, is carried on in the principal timber regions in Maine. This account was furnished me by a highly-intelligent friend residing in Bangor, and I trust it will be interesting from its own merit, as well as from the importance of the branch of industry which it describes.

"When a lumberer has concluded to log on a particular tract, the first step is, to go with a part of his hands and select suitable situations for building his camps. In making this selection, his object is to be near as possible to the best clumps of timber he intends to haul and to the streams into which he intends to haul it. He then proceeds to build his camps and to cut out and clear out his principal roads. The camps are built of logs, being a kind of log houses. They are made about three feet high on one side, and eight or nine on the other, with a roof slanting one way. The roof is made of shingles split out of green wood and laid upon rafters. The door is made of such boards as can be manufactured out of a log with an axe. Against the tallest side of the camp is built the chimney—the back being formed by the wall of the camp, and the sides made by green logs, piled up for jams, about eight feet apart. The chimney seldom rises above the roof of the camp; though some who are nice in their architectural notions sometimes carry it up two or three feet higher. It is obvious from the construction that nothing but the greenness of the timber prevents the camp from being burned up immediately; yet the great fires that are kept up make but little impression, in the course of the winter, upon the back or sides of the chimney. A case, however, happened within a year or two, where a camp took fire in the night and was consumed, and the lumberers in it were burned to death. Probably the shingle roof had become dry; in which case a spark would kindle it, and the flames would spread over it in a moment.

"Parallel to the lower side of the building, and about six feet from it, a stick of timber runs on the ground across the camp. The space between this and the lower wall is appropriated to the bedding, the stick of timber serving to confine it in its place. The bedding consists of a layer of hemlock boughs spread upon the ground, and covered with such old quilts and blankets as the tenants can bring away from their homes. The men camp down together, with their heads to the wall, and their feet towards the fire. Before going to bed they replenish their fire—some two or more of them being employed in putting on such logs as with their handspikes they can manage to pile into the chimney. As the walls of the building are not very tight, the cool air plays freely around the head of the sleeper, making a difference of temperature between the head and the feet not altogether agreeable to one unused to sleep in camps. A rough bench and table complete the furniture of the establishment. A camp very similar, though not so large in dimensions, is built near for the oxen; on the top of this the hay is piled up, giving it some warmth, while it is convenient for feeding.

"A large logging concern will require a number of camps, which will be distributed over the tracts so as best to accommodate the timber. One camp serves generally for one or two teams. A team, in ordinary logging parlance, expresses, not only the set of four or six oxen that draw the logs, but likewise a gang of men employed to tend them. It takes from three or four to seven or eight men to keep one team employed—one man being employed in driving the cattle, and the others in cutting down the trees, shaping them into logs, barking them, and cutting and clearing the way to each tree. The number of hands required is inversely to the distance the logs are to be hauled; that is, most hands are required when the distance is shortest, because the oxen, returning more frequently, require their loads to be prepared more expeditiously.

"Having built their camps, or while building them, the main roads are to be cut out. These run from the camps to the landing-places, or some stream of sufficient size to float down the logs on the spring freshet. Other roads are cut to other clumps of timber. They are made by cutting and clearing away the underbrush, and such trees and old logs as may be in the way, to a sufficient width for the team of oxen, with the bob sled and timber on it, to pass conveniently. The bob sled is made to carry one end of the timber only; the other drags upon the ground; and the bark is chipped off, that the log may slip along more easily.

"The teams proceed to the woods, when the first snows come, with the hands who are not already there and the supplies. The supplies consist principally of pork and flour for the men, and Indian meal for the oxen; some beans, tea, and molasses are added. Formerly hogsheads of rum were considered indispensable; and I have before me a bill of supplies for a logging concern of three teams in 1827–28, in which I find one hundred and eighty gallons of rum charged; but of late very few respectable lumberers take any spirits with them, and the logging business is consequently carried on with much more method, economy, and profit. The pork and flour must be of the best quality. Lumberers are seldom content to take any of an inferior sort; and even now, when flour is twelve dollars a barrel, they are not to be satisfied with the coarser breadstuffs.

"Hay is procured as near to the camps as possible; but as most of the timber lands are remote from settlements, it is generally necessary to haul it a considerable distance; and as it must be purchased of the nearest settlers, they are enabled to obtain very high prices. From twelve to twenty dollars per ton is usually paid. When the expense of hauling it to the camp is added, the whole cost is frequently as high as thirty dollars a ton, and sometimes much higher. Owners of timber lands at a distance from settlements may make a great saving by clearing up a piece of their land and raising their own hay.

"Some one of the hands, who has not so much efficiency in getting timber as skill in kneading bread and frying pork, is appointed to the office of cook. Salt pork, flour, bread, and tea constitute the regular routine of the meals, varied sometimes with salt fish or salt beef. Potatoes are used when they can be obtained. Now and then, perhaps, when the snow is deep, they catch a deer, and live on venison.

"The men are employed through the day in cutting the timber and driving the teams. In the evening some take care of the oxen; some cut wood for the fire; then they amuse themselves with stories and singing, or in other ways, until they feel inclined to turn in upon the universal bed. On Sundays the employer claims no control over their time beyond the taking care of the cattle, the fire, and the cooking. On this day they do their washing and mending; some employ themselves besides in seeking timber, and some in hunting partridges, while some remain in the camp and read the Bible.

"They remain in the woods from the commencement of sledding, some time in December, until some time in March, in the course of which month their labors are usually brought to a close by the snow, it becoming too shallow or too deep. If there are heavy thaws the snow runs off, not leaving enough to make good hauling. If, on the other hand, it gets to be four or five feet deep, the oxen cannot break through it to make the path which it is necessary to form in order to get at each individual tree. The men and teams then leave the woods. Sometimes one or two remain, to be at hand when the streams open. I know one who last winter staid by himself in the woods fifteen or twenty miles from the nearest habitation for the space of twenty-eight days, during which time he earned $203 by getting in timber with his axe alone, being allowed for it at the same rate per thousand that the lumberers were in getting it in with their teams. He found some berths in the banks of the stream, where all that was necessary was, to fell the tree so that it should fall directly upon the water, and there cut it into logs to be ready for running.

"When the streams are opened, and there is sufficient freshet to float the timber, another gang, called 'river drivers,' takes charge of it. It is their business to start it from the banks and follow it down the river, clearing off what lodges against rocks, pursuing and bringing back the sticks that run wild among the bushes and trees that cover the low lands adjoining the river, and breaking up jams that form in narrow or shallow places. A *jam* is caused by obstacles in the river catching some of the sticks, which in their turn catch others coming down; and so the mass increases until a solid dam is formed, which entirely stops up the river and prevents the further passage of any logs. These dams are most frequently formed at the top of some fall; and it is often a service that requires much skill and boldness, and is attended with much danger, to break them up. The persons who undertake it must go on to the mass of logs, work some out with their pick poles, cut some to pieces, attach ropes to others to be hauled out by the hands on shore, and they must be on the alert to watch the moment of the starting of the timber, and exercise all their activity to get clear of it before they are carried off in its tumultuous rush.

"Some weeks, more or less, according to the distance, spent in this way, bring the timber to the neighborhood of the saw-mills. A short distance from Oldtown, on the Penobscot, there is a boom established, extending across the river, for the purpose of stopping all the logs that come down. It is made by a floating chain of logs, connected by iron links, and supported at suitable distances by solid piers built in the river; without this it would be impossible to stop a large part of the logs, and they would be carried on the freshet down the river and out to sea. The boom is owned by an individual, who derives a large profit from the boomage, which is thirty-five cents per thousand on all logs coming into it. The boom cost the present owner about $40,000. He has offered it for sale for

$45,000. It is said the net income from it last year was $15,000.

"Here all the logs that come down the Penobscot are collected in one immense mass, covering many acres, where is intermingled the property of all the owners of timber lands in all the broad region that is watered by the Penobscot and its branches, from the east line of Canada, above Moosehead Lake, on the one side, to the west line of New Brunswick on the other. Here the timber remains till the logs can be sorted out for each owner and rafted together to be floated to the mills or other places below. *Rafting* is the connecting the logs together by cordage, which is secured by pins driven into each log, forming them into bands like the ranks of a regiment. This operation is performed by the owner of the boom. The ownership of the timber is ascertained by the marks which have been chopped into each log before it left the woods, each owner having a mark, or combination of marks, of his own. When the boom is full only the logs lowest down can be got at; and the proprietors of other logs must wait weeks, sometimes months, before they can get them out, to their great inconvenience and damage.

"After the logs are rafted and out of the boom, a great part of them are lodged for convenience in a place called Pen Cove, which is a large and secure basin in the river, about two miles below the boom. From this cove they can be taken out as they are wanted for the mills below. While in the boom and at other places on the river they are liable to great loss from plunderers. The owners or drivers of logs will frequently smuggle all that come in their way without regard to marks. The owners or conductors of some of the mills on the river are said to be not above encouraging and practising this species of piracy. Indeed, timber in all its stages seems to be considered a fair object for plunderers, from the petty pilferer who steals into the woods, fells a tree, cuts it into shingles, and carries it out on his back, to the comparatively rich owner of thousands of dollars.

"When the logs have been sawn at the mills there is another rafting of the boards, which are floated down the river to Bangor, to be embarked on board the coasters for Boston. In this process they are subject to much injury: first, by the mode of catching them as they come from the mill sluices, the rafters making use of a picaroon, or pole, with a spike in the end of it, which is repeatedly and unmercifully driven into the boards, taking out, perhaps, a piece at each time; secondly, by the holes made by the pins driven into the boards in rafting; and, thirdly, by the rocks, and rapids, and shallows in the river breaking the rafts to pieces and splitting up the boards as they descend. These inconveniences will be partly remedied by the railroad now in operation, unless other inconveniences in the use of it should be found to overbalance them.

"The kinds of timber brought down our rivers are pine, spruce, hemlock, ash, birch, maple, cedar and hackmatack. Far the greater part of it is pine. The lumberers make about six kinds of pine, though they do not agree exactly in the classification or in the use of some of the names. The most common division is into pumpkin pine, timber pine, sapling, bull sapling,* Norway, and yellow, or pitch pine. The pumpkin pine stands preëminent in the estimation of the lumberers, because it is the largest tree, and makes fine, large, clear boards. They are soft and of a yellowish cast. The timber pine and saplings are the most common. The former is generally preferred, as being larger and more likely to be sound; yet the saplings are said to make the harder and more durable boards. The common sapling grows in low lands, generally very thick, but much of it is apt to be rotten. The bull sapling is larger and sounder, grows on higher land, and is mixed with hard wood. The Norway pine † is a much harder kind of timber than the others. It is seldom sawed into boards, though it makes excellent floor boards, but it is generally hewn into square timber. In the Provinces it bears a higher price than the others. There is not much of it brought to market, and it is not very abundant in the woods. The yellow pine is very scarce, if to be found at all, in that region.

"I will conclude with some remarks upon the different modes of operating made use of by owners of timber. These are three. One is, for the owner to hire his men by the month, procure teams, and furnish them with equipments and supplies. A second is, to agree with some one or more individuals to cut and haul the timber, or cut, haul, and run it, at a certain price per thousand feet. The third way is, to sell the *stumpage* outright; that is, to sell the timber standing.

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* All the kinds here named, with the exception of the last two, are varieties of white pine.

† This pine is called also red pine, from the color of its bark.

"The first mode is seldom adopted unless the owner of the timber is likewise a lumberer and intends to superintend the business himself. The second mode is very common. It is considered the most saving to the owners, because the lumberer has no inducement to select the best timber and leave all that is not of the first quality; to cut down trees and take a log, and leave others to rot that are not quite so good, but which may be well worth hauling. Its inconveniences are, that, as the object of the lumberer is to get as large a quantity as possible, he will take trees that are not worth as much as the cost of getting them to market, and which, besides being of little value themselves, render the whole lot less salable by the bad appearance they give it. The owner, too, is subject to all the losses that may happen in running the logs down the river. Very frequently he is obliged to make one contract to have the timber cut and hauled to the landing-places, and another to have it run down; for the river drivers are a distinct class from the lumberers. Most of them, indeed, are lumberers; yet it is but a small part of the lumberers that are river drivers. A great part of the lumberers are farmers, who must be on their farms at the season of driving, and therefore cannot undertake any thing but the cutting and hauling. They are paid for the number of thousand feet they deposit at the landing-places; and the logs being surveyed, or scaled, as they are hauled, their object is to get as many thousand as possible on the landing-places; while the river drivers may be very careless about getting them all down, and the owner may never receive the whole quantity he has paid for cutting and hauling. In operating in this mode, the owner usually furnishes the supplies, provisions, &c., and the lumberer procures the teams and hires the men. The owner commonly does not bind himself to pay before the logs get to market, and he frequently makes a contract for his supplies on the same condition; in which case he has to pay from twenty-five to thirty-three per cent. more for his goods than he would dealing on cash or common credit. Sometimes, when there is no freshet, the logs do not get down until the second year; and then the trader and lumberer both suffer for want of their pay.

"The third mode is the simplest and easiest for the owner. He avoids all trouble of furnishing supplies, of watching the timber on the river, and of looking out for a market. But he must have a man of some capital to deal with, as he furnishes his own teams and supplies, and pays his men, receiving very heavy advances. The purchaser of it has no interest to cut the timber savingly, and he sometimes makes dreadful havoc among the trees, leaving a great deal of valuable stuff on the ground to rot. And if he selects only the best trees in a berth, much of the timber left standing may be lost, because no one will afterwards want to go into that berth from which all the best trees have been culled. It is common now, in all large concerns, for the owner to employ a man to pass the winter in the camps, living alternately at one or another, for the purpose of scaling the logs, keeping a correct account of them, and seeing that the timber is cut according to the contract. But, after all, there is always found to be a considerable difference between timber cut by the thousand and that which is cut on stumpage.

"Each mode has its troubles; but I think that owners at a distance will manage their concerns with least vexation by selling the stumpage, provided that they have honest men to deal with."

The public attention is of late, we hope, more alive than it has been to the value of our forests, to the necessity of economizing what yet remains of these rich national treasures, and of replacing what has been so carelessly wasted. This necessity is every day making itself more manifest. Fuel has already become scarce in our sea ports, or rather on our whole sea coast—a fact worthy the serious consideration of those who reflect that the sufferings of the poor from the want of this article are probably greater than from all other causes united.

Our best timber also is becoming more and more costly, and our civil and naval architects are constantly driven to the employment of that of inferior quality. The live oak of the Southern States is already procured for our navy yards with great difficulty, and in fifty years will probably disappear from our soil; and our own white oak, as well as our other most valuable timber trees, must follow at no very distant period. It is in the power of every one who possesses a few acres of land to do much to arrest this mighty evil; and what might not be anticipated from a simultaneous effort on the part of cultivators in our Commonwealth, or even in a single county! and all this at the expense, on the part of each individual, of a few shillings of money and a few hours of interesting labor. If we owe any thing to posterity, in what way could we confer on them so great a benefit at so cheap a rate?

It is not, however, strictly true, or rather it is not the whole truth, to say, with Virgil, that he who plants benefits his remote posterity. A friend of mine once observed that those who set out forest trees reminded him of the student, who, on hearing that a crow would live for a century, bought a young one for the sake of watching the experiment. As a stroke of humor, this remark is privileged from criticism; but as a statement of fact, it must be received with much qualification. It is no uncommon circumstance to find oaks of twenty years' growth of more than a foot in diameter and of forty or fifty feet in height; and I have seen an English willow of only double that age, measuring, at several feet from the ground, more than seven yards in circumference.

Were planting commenced at the time when our young men usually enter on their professions or their business, how many might live to enjoy the shade of majestic groves of their own raising!

These remarks may derive some additional interest from the fact that a taste for rural occupations is rapidly springing up and extending itself in our large cities, and that objects of this description are gradually absorbing more and more of the capital as well as the intelligence of that portion of our community. Where, indeed, could they find a source of entertainment more pure, more copious, or more beneficial to themselves or their fellow-citizens? To say nothing of the value of forest trees for what are strictly denominated useful purposes, let us ask, in what way any individual among us can do more to decorate and beautify the country? How many millions have been devoted in this as well as in other communities to architecture! and yet how little have the results corresponded to the time, the effort, and the money so expended! For one chaste and magnificent edifice we have ten irregular and disproportioned piles, countenancing, and almost justifying, the sweeping remark of a distinguished author, that the genius of architecture had shed its malediction on America. But he who rears a stately grove or avenue bestows an ornament on his native land which none but a Vandal would wish to destroy.

How much has been done in Boston and its beautiful environs by the taste and public spirit of a few individuals! To pass over numerous other instances, we are indebted to some unknown benefactor of former days for the chief ornament of the city—the triple colonnade of weeping elms in the Mall; and it is owing to the good taste of another accomplished individual of later days (the late G. W. Brimmer, Esq.) that the majestic, or, as we may now call them, the sacred, groves of Mount Auburn were rescued from the woodman's axe.

It is not merely, however, to those who are or may be practically engaged in the propagation or preservation of forest trees, though these I hope are not few, that these remarks are directed. Though comparatively a small number may be the planters or the owners of groves or of gardens, all may be admirers of forest scenery. For the indulgence of such a taste we have the highest intellectual authority. "A tree in full leaf," says Lord Bacon, "is a nobler object than a king in his coronation robes." But it is in a community like our own, above all others, that a taste for the beauties of forest trees, as well as an acquaintance with their nature and uses, should be carefully cultivated. It is sufficient to recommend it that it furnishes a never-failing source of occupation and amusement to those who travel in this country, and a strong additional inducement to the general adoption of this practice, so essential, and at the same time so neglected.

Personal intercourse, if not the only, is certainly the chief, means by which the inhabitants of the different States of our widely extended Union may be enabled to acquire a proper knowledge of the wants and the character of each other, and, above all, to cherish those feelings of regard so essential to the prosperity, if not the existence, of our nation. The press, however great the obligations we owe it, is of necessity always an imperfect, and sometimes an unfaithful, mirror of public sentiment; and it is to personal intercourse, and to the spirit of mutual fairness and friendship which such intercourse will assuredly generate, that we must look to supply the deficiencies and correct the aberrations of that mighty engine of good and of evil.

It were to be wished, indeed, that the practice of travelling extensively in our own country were often pursued, at least as a preliminary to a European tour. We should not find in that case, as we think we now do in some instances, the most incorrect representations of the character and manners of our population, proceeding from the pens of our own tourists in other countries. To many of our best educated and most accomplished men the interior of other States, if not of their own, is a *terra incognita*, and this, too, in spite of those facilities of communication which exist in the United States to a greater degree than in almost any portion of the old world.

I need not state how thinly this country is peopled in comparison with any other in an equal state of advancement, nor repeat how large a portion of those wide spaces which separate our principal settlements from each other is covered with magnificent forests. The traveller who can relish the beauties of these splendid collections of vegetable wonders can have few intervals of idleness or weariness.

Yet, however valuable we may consider a taste for these prominent beauties of our own scenery merely as a never-failing source of occupation and enjoyment, there are still other reasons of the highest moment why such a taste should be anxiously cherished; we mean as one of the principal sources of an ardent and deep-felt patriotism. We trust that our country has, in the view of all of us, other qualities than the beauties of her natural scenery to recommend her to her proper rank in our estimation. There is in her institutions—political, intellectual, and religious—more than enough to justify us in the preference which we give to our native land over all others.

But patriotism, wherever it has existed in a high degree, has been, I apprehend, a *sentiment* as well as a principle, and is something more than a cold feeling of preference. It is, in truth, an emotion of a complex character; and if we would cherish towards our country an enthusiastic attachment, we should not suffer ourselves to be blind to those charms, whether of nature or of art, which may recommend her to our fancy as well as our sober judgment.

Why should not the mind of an American dwell upon those majestic forests whose beauties are commemorated throughout the civilized world with something of the feeling which stirs in the bosom respectively of a patriotic Frenchman or Englishman when his thoughts revert to the vine-covered hills and gay regions of France or the spreading oaks and verdant lawns of merry England?

It is truly gratifying to reflect on the progress which has been made within a very few years in the study and development of the internal resources of this country.

In former times, the political condition of Europe, and the embarrassments in which we were involved by the conduct of the leading belligerents, formed not only the predominant, but the sole, topics of deep public interest. Little time or thought could be spared, little at any rate was spared, for the examination and improvement of our internal condition. What, for instance, had been done for the advancement of our agriculture and manufactures? and what was known of our coal mines or our quarries? Such was the state of things from the very foundation of our national government to the signing of the treaty of Ghent. It is one of the chief national blessings which have resulted from our present peaceful condition that we have been enabled and induced to turn our thoughts *inward;* that the vast natural riches of our land are no longer trodden under foot without the slightest investigation, nor its majestic and beautiful scenery passed by with a heedless glance. Whether we regard this spirit of investigation merely as political economists, or as moralists and patriots, whether we look to its effects on the wealth or on the happiness of our community, it is certain that to cultivate and to cherish it is a sacred duty.

APPENDIX.

[A.]

Referred to on page 6.

Schedule and Appraisal of the Stock, Tools, and Implements, together with the estimated value of the Land and Buildings referred to in the agreement between the Trustees of the State Reform School at Westboro' and the State Board of Agriculture, received April 1, 1854:—

1	Pair Fat Oxen,		$170 00
3	Pairs Oxen—Red, $150; Brindle, $160; Bay, $150,		460 00
25	Cows, at $32 each,		800 00
2	Heifers, at $15 each,		30 00
1	Grade Devon Bull,		50 00
2	Horses—Charley, $150; Kate, $125,		275 00
35	Swine,		575 00
12	Tons English Hay, at $17,	$204 00	
8	Tons Meadow Hay, at $8,	64 00	
1	Ton English Hay, at $17,	17 00	
½	Ton Straw,	5 00	
4	Tons Corn Fodder,	24 00	314 00
500	Bushels Corn, at $1,		500 00
40	Bushels Oats, at 50 cts.,		20 00
500	Bushels Carrots, at 20 cts.,		100 00
160	Bushels Turnips, at 20 cts.,		32 00
4	Straw Cutters,		50 00
1	Feed Trough,		4 00
12	Hay Forks, $3; 6 Rakes, $1,		4 00
12	Manure Forks,		12 00
20	Shovels,		5 00
9	Spades,		5 00
12	Picks,		12 00
	Manure Troll, $1,		1 00
7	Iron Bars,		7 00
3	Stone Hammers,		5 00
1	Ox Wagon,		40 00
1	Horse Wagon,		20 00
3	Carts,		70 00
2	Horse Carts,		35 00
3	Stone Drags,		5 00
6	Ploughs,		30 00
3	Harrows,		12 00
2	Cultivators,		4 00
2	Hand Cultivators,		4 00
8	Ox Yokes,		10 00
8	Draft Chains,		8 00

4	Trace Chains,	$3 00
4	Stake Chains,	3 00
2	Ox Sleds,	10 00
2	Horse Sleds,	12 00
1	Buggy,	50 00
1	Sleigh,	25 00
	Harness,	65 00
	Stable Furniture, Buffalo Robes, &c.,	15 00
	Articles in the Tool Room,	10 00
1	Iron Roller,	20 00
1	Fanning Mill and Corn Sheller,	12 00
	Seed Corn,	4 00
5	Bushels Beans,	10 00
8	Door Chains,	2 00
1	Seed Sower,	5 00
2	Pairs Steelyards,	3 00
54	Bushels Potatoes,	40 00
150	Pounds Guano,	4 00
	Superphosphate,	48 00
150	Strawberry Boxes,	4 00
17	Hoes, $3; 1 Drill, $2,	5 00
10	Wheelbarrows,	6 00
	Beetle and Wedges, $2; Lot of Measures, $1,	3 00
	Grass Shears, $1; Iron Rakes, $1,	2 00
4	Water Cans, $4; 3 Bog Hooks, $4,	8 00
9	Axes, $8; 3 Saws, $3,	11 00
3	Ice Hooks, $1; Tongs, $2,	3 00
2	Cross-cut Saws,	7 00
2	Hand Saws,	1 00
12	Baskets, $6; 6 Scythes, $2; 12 Snaths, $6,	14 00
	Grindstone,	7 00
		$4,081 00

REAL ESTATE.

Land, supposed about 285 acres,	$8,400 00	
Farm Barn,	1,600 00	
Two Dwelling-houses,	2,000 00	
		$12,000 00
Total,		$16,081 00

[B.] CASH ACCOUNT OF THE TREASURER.

Dr. *C. L. Flint in Account with the State Board of Agriculture.* *Cr.*

1854.			1854.		
April 13,	To cash received from State Treasurer,	$500 00	April 13,	By cash paid for two yoke of oxen at $160,	$320 00
" 18,	" cash received from State Treasurer,	500 00	" 13,	" cash paid S. N. White for expenses on the farm,	153 00
May 23,	" cash received from State Treasurer,	300 00	" 19,	" cash paid Ruggles, Nourse and Mason for tools, guano, &c.,	328 92
June 20,	" cash received from State Treasurer,	900 00	May 17,	" cash paid Davenport for superphosphate,	23 97
" 25,	" cash received from State Treasurer,	200 00	" 17,	" cash paid Stearns for potash to be used on the farm,	31 76
July 1,	" cash received from State Treasurer,	500 00	" 19,	" cash paid Morrill for ground bone,	12 50
" 3,	" cash received from State Treasurer,	100 00	" 20,	" cash paid J. Newell for farm-horse,	170 00
Aug. 3,	" cash received from State Treasurer,	750 00	" 23,	" cash paid Hammond for nails, posts, &c., for piggery,	200 00
Sept. 4,	" cash received from State Treasurer,	850 00	June 20,	" cash paid Eaton for lumber, for piggery, &c.,	827 29
Oct. 5,	" cash received from State Treasurer,	800 00	" 28,	" cash paid Hammond for shingles, labor, &c., on piggery,	200 00
" 7,	" cash received from State Treasurer,	200 00	July 1,	" cash paid S. N. White to pay laborers on farm,	650 00
Nov. 4,	" cash received from State Treasurer,	400 00	" 13,	" cash paid Stevens for scales for the farm,	17 81
" 27,	" cash received from Treas. State Ref. School,	500 00	Aug. 3,	" cash paid Hammond, for labor, lumber, &c., for piggery,	550 00
			" 3,	" S. N. White to pay for hay,	212 00
			Sept. 7,	" cash paid S. N. White for expenses on the farm,	135 00

		"	16,	" cash paid Hammond for labor on piggery and tool house, ...	594 00
		Oct.	5,	" cash paid S. N. White for laborers on the farm, ...	828 12
		"	7,	" cash paid S. N. White for expenses on the farm, ...	240 00
		Nov.	3,	" cash paid S. Brown for mounting map of survey, ...	1 50
		"	7,	" cash paid Hammond for labor on tool house,	300 00
		"	15,	" cash paid Hammond for labor on tool house,	175 00
		"	28,	" cash paid S. N. White for labor on the farm, ...	125 00
					$6,095 87
				By cash on hand Dec. 1, 1854, . .	404 13
	$6,500 00				$6,500 00

Boston, Dec. 1, 1854.—I have examined the foregoing account, and find it correctly cast and properly vouched.

J. H. W. PAGE,

Chairman of Auditing Committee.

[C.] COST OF THE BUILDINGS REFERRED TO ON PAGE 12.

Dr. *Board of Agriculture in Account with J. H. Hammond.* *Cr.*

To Wm. Eaton for lumber,	$827 29	By paid Wm. Eaton for lumber,	$827 29
" M. C. Warren for hardware,	63 19	" cash received from C. L. Flint, to Dec. 6,	2,305 64
" B. Barstow for shingles,	210 00	" cash received for lumber, chips, &c.,	16 00
" Boston and Worcester Railroad for freight,	97 55		
" Charles Brooks for hardware,	8 94		$3,148 93
" Wm. S. Perry for lumber,	46 50	Rec'd from J. H. Hammond,	50 00
" Calvin Foster for hardware,	2 33		
" Ruggles, Nourse & Mason for engine wheels,	3 50		
" C. S. Hardy for blacksmithing,	86 54		
" Abner Fisk for painting,	11 10		
" Jonathan Sibley for wheels,	12 00		
" George Fenlee for ropes,	7 62		
" Davis and Bullard for horse-hire,	33 00		
" Wm. W. Howard for labor,	4 37		
" B. Boynton for pump, lead, &c.,	32 93		
" John H. Pierce for posts,	21 39		
" J. H. Hammond for labor,	391 61		
" Calvin Foster for paint, oil, &c.,	63 42		
" Geo. N. Sibley for hardware,	33 06		
" Sundry bills for labor,	35 49		
" R. G. Holmes for lumber and labor,	455 13		
" Wm. Eaton for lumber,	159 50		
" Edwin Chapin for lumber,	65 13		
" J. W. Bartlett for windows, &c.,	37 00		
" B. B. Nourse for labor,	305 25		

" Jonas Longley for lath and hardware,	4 45	
" Wm. H. Sibley for hardware,	4 00	
" David Conley for labor,	43 87	
" Wm. Eaton for lumber,	24 15	
" B. P. Brailey for use of wagon,	3 50	
" Jonas Stone for use of wagon,	3 00	
" Ethan Bullard for lumber,	7 35	
" J. L. Forbush for lumber,	3 37	
" S. N. White for labor, &c.,	12 68	
	$3,120 21	
" Amount of labor by S. N. White,	110 00	
" " paid Institution for dinners,	26 33	
	$3,256 54	
Deduct lumber, nails, &c., on hand,	115 26	
	$3,141 28	
Deduct for swill cart,	42 35	
Cost of buildings,	$3,098 93	$3,098 93

Cost of piggery and slaughter-house,	$2,032 62
Cost of granary, tool-house, &c.,	1,066 31
Total,	$3,098 93

[D.] *State Board of Agriculture in Account with the Commonwealth.*

Dr.

To real estate from Trustees State Reform School, per inventory,	$12,000 00	
" personal estate from Trustees State Reform School, horses, cattle, hogs, &c.,	2,360 00	
" personal estate from Trustees State Reform School, hay, corn-fodder, oats, &c.,	314 00	
" personal estate from Trustees State Reform School, Indian corn, oats, &c.,	520 00	
" personal estate from Trustees State Reform School, carrots, turnips, &c.,	132 00	
" personal estate from Trustees State Reform School, farming utensils,	755 00	
		$16,081 00
" cash received of State Treasurer,		6,000 00
" produce of farm sold State Reform School, 6,469½ galls. milk,	776 34	
" produce of farm sold State Reform School, 2,578 lbs. beef,	149 77	
" produce of farm sold State Reform School, 5,155 lbs. pork,	370 01	
" produce of farm sold State Reform School, 511 lbs. veal,	40 88	
" produce of farm sold State Reform School, 9,330 lbs. hay,	75 97	
" produce of farm sold State Reform School, 120 bushels corn,	120 00	
" produce of farm sold State Reform School, 1,201 bushels potatoes,	640 18	
" produce of farm sold State Reform School, fruit,	192 01	

Cr.

By real estate, per inventory,	$12,000 00	
" personal estate, Dec. 1, 1854, by appraisal, live stock,	2,702 00	
" personal estate Dec. 1, 1854, hay and corn-fodder,	1,126 00	
" personal estate Dec. 1, 1854, Indian corn,	900 00	
" personal estate Dec. 1, 1854, roots,	762 13	
" personal estate Dec. 1, 1854, farming utensils,	827 07	
" personal estate Dec. 1, 1854, lumber, nails, &c.,	99 75	
" personal estate Dec. 1, 1854, 1 ton guano,	54 00	
		$18,470 95
" personal estate, cost of piggery and slaughter-house,	2,032 62	
" personal estate, cost of tool-house and granary,	1,066 35	
" personal estate, labor for improvements,	1,000 00	
" personal estate, labor of men, boys and teams, for State Reform School,	836 02	
		4,934 95
" cash, paid 2 yoke oxen, 4,	315 00	
" cash, one horse,	170 00	
" cash, fertilizers,	286 44	
" cash, garden seeds, 9,	14 12	
" cash, farming utensils, 1, 10, 11, 12, 13, 14,	250 85	
		1,036 41
" cash, corn, rye, oats, millet, &c., for seed, 15, 16, 17, 18, 19,	115 41	
" cash, seed, potatoes,	27 45	

To produce of farm sold State Reform School, garden vegetables,	474 78	
" produce of farm sold State Reform School, lard,	2 60	
" produce of farm sold State Reform School, lumber,	7 28	
" produce of farm sold State Reform School, rent of Warren House,	29 16	
		2,878 98
" produce of farm sold as follows, viz.:—		
" strawberries, milk and apples,	90 00	
S. N. White,	22 39	
" M. Sullivan, pork,	25 87	
" P. Fitz, pork,	11 32	
" Halloran, pork and vegetables,	17 30	
" J. Doyle, pork and vegetables,	18 60	
" Received Mr. Bourn, roots,	14 50	
" cash, use of male animal,	7 00	
" oxen, Rice and Brigham,	180 00	
" Harvey Dodge,	150 00	
		536 98
" cash received Treas'r State Reform School,		500 00
" debts due and unpaid, Dec. 1, 1854,		690 28
" balance due from Treasurer State Reform School,		1,291 42
" balance Dec. 1, 1854,		1,735 98
		$29,714 64

" cash, hay, 21, 22, 23, 12,	335 07	
" cash, repairs, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43,	79 04	
" cash, blacksmithing, 43, 44, 45, 46,	101 92	
" cash, fare on railroads, postage, &c.,	32 70	
" cash, railroad freight,	19 79	
" cash, sundries, 14, 24, 25, 26, 27, 28, 29, 30, 31,	126 14	
" cash, paid men for labor,	2,107 11	
		2,944 63
" cash, paid State Reform School, boys' labor,	883 10	
" cash, paid State Reform School, men's board,	602 43	
" cash, paid State Reform School, swill,	233 36	
" cash, paid State Reform School, board, surveyor, barrels, &c.,	204 68	
		1,923 57
" cash on hand, Dec. 1st., 1854,		404 13
		$29,714 64

[E.] PROBABLE BALANCE APRIL 1, 1855.

To sale of milk,	$300 00	By hay consumed,	$700 00
" increased value of cows and calves,	345 00	" roots consumed,	600 00
" labor for improvement,	300 00	" Indian corn,	150 00
" increased value of hogs and sale of pork,	200 00	" swill,	116 00
" teaming for State Reform School,	300 00	" wages of men,	648 00
" balance of account Dec. 1, 1854,	1,735 98	" board of men,	208 00
		" wages of boys,	200 00
			$2,622 00
		Balance April 1, 1855,	558 98
	$3,180 98		$3,180 98

The balance of the account is up to December 1, 1854. From that day to the 1st day of April, 1855, the probable increase or earnings of the farm, &c., will be as stated above.

This balance would be much greater were it not important to employ a higher class of labor for the good management of the boys than is necessary to do the mere work of the farm, and greater still if the farmers could board upon the farm at actual cost instead of paying at the Institution three dollars a week for board of each man.

[F.]

Inventory of Personal Property on the State Farm at Westboro', December 1, 1854:—

4	Yoke Oxen,	$665 00
23	Cows,	805 00
1	Heifer Calf,	4 00
1	Full blood Jersey Bull,	150 00
3	Horses,	520 00
75	Swine,	558 00
43	Tons English Hay,	774 00
18	Tons Meadow Hay,	162 00
7	Tons Straw,	70 00
900	Bushels Indian Corn,	900 00
2058	Bushels Carrots, 25 cts.,	514 50
1025	Bushels Turnips,	170 83
20	Tons Corn Fodder,	120 00
4	Hay Cutters,	50 00
1	Feed Trough,	4 00
12	Hay Forks,	5 00
18	Hay Rakes,	5 40
28	Manure Forks,	28 00
48	Shovels,	25 00
18	Spades,	15 00
18	Picks,	18 00
2	Manure Forks,	1 00
9	Iron Bars,	9 00
4	Stone Hammers,	6 00
1	Ox Wagon,	40 00
2	Horse Wagons,	70 00
3	Ox Carts,	70 00
2	Horse Carts,	35 00
3	Stone Drags,	5 00
6	Ploughs,	30 00
4	Harrows,	15 00
3	Cultivators,	10 00
2	Hand Cultivators,	4 00
8	Ox Yokes,	15 00
10	Draft Chains,	10 00
4	Stake Chains,	3 00
4	Trace Chains,	2 00
2	Ox Sleds,	7 00
2	Horse Sleds,	12 00
1	Buggy Wagon,	20 00
1	Sleigh,	25 00

	Stable Utensils, including Buffaloes,	$15 00
	Articles in Tool House,	10 00
1	Iron Roller,	20 00
	Lot of Harness,	65 00
1	Fanning Mill,	12 00
4	Door Chains,	1 00
1	Seed Sower,	5 00
	Scales and Steelyards,	21 00
128	Bushels Potatoes,	76 80
1	Ton Guano,	54 00
100	Strawberry Boxes,	3 00
40	Hand Hoes,	12 00
1	Drill,	2 00
8	Wheelbarrows,	8 00
	Lot Measures and Grass Shears,	2 00
1	Beetle and Wedges,	2 00
2	Water Cans,	1 00
3	Bog Hooks,	4 00
9	Axes,	5 00
4	Wood Saws,	4 00
3	Ice Hooks,	1 00
	Ice Tongs,	2 00
2	Cross-cut Saws,	5 00
2	Hand Saws,	1 00
8	Baskets,	4 00
6	Grass Scythes,	2 00
12	Grass Snaths,	6 00
1	Grindstone,	7 00
6	Bush Scythes,	4 00
2000	Clear Lumber,	80 00
500	Spruce Lumber,	10 00
200	Pounds Nails,	9 75
3	Buckets,	75
1	Surveyor's Chain,	2 00
1	Iron Ox Shovel,	6 50
1	Spirit Level,	2 00
1	Swill Cart,	42 35
1	Refrigerator,	11 00
		$6,471 88

ABSTRACT OF AGRICULTURAL RETURNS,

1854.

RETURNS OF AGRICULTURAL SOCIETIES FOR 1854.

FINANCES.

SOCIETIES.	Amount received from the Commonwealth for the y'r.	Income of the Fund.	New members and Donations.	All other sources.	Whole amount of Receipts for the year.	Amount of Premiums and Gratuities offered.	Amount of Premiums, &c., awarded.	Amount of Premiums paid out.	Current expenses of the Society for the year.	Whole amount of Disbursements for the year.	Value of Real Estate belonging to the Society.	Amount of the permanent Fund (par value.)	Total amount of all the property of the Society.
Massachusetts,	$600 00	$1,943 00	–	$153 60	$2,696 60	*$394 24	–	$300 00	$556 30	$1,250 54	–	$24,100 00	24,100 00
Essex, . .	600 00	604 28	$212 00	431 60	1,847 88	1,603 00	$883 37	812 93	559 06	1,371 99	–	9,770 70	11,012 94
Middlesex, .	600 00	180 00	50 00	350 00	1,180 00	1,071 75	628 75	619 25	450 00	1,069 25	$2,000 00	3,000 00	5,000 00
Middlesex S., .	600 00	–	2,988 00	452 00	3,440 00	987 00	797 00	653 37	523 32	3,121 37	2,300 00	3,500 00	3,500 00
Worcester, .	600 00	738 00	215 00	1,260 00	2,813 00	1,129 00	658 00	658 00	500 00	6,400 00	14,000 00	3,840 00	17,840 00
Worcester W.,	600 00	191 75	96 00	–	887 75	665 00	413 75	442 37	214 76	654 13	–	3,175 00	3,175 00
Worcester N., .	†840 00	125 41	683 00	8 50	1,656 91	477 00	434 79	395 23	122 26	517 49	–	2,800 00	2,800 00
Hampshire, Franklin and Hampden, .	600 00	465 25	55 00	335 00	1,455 25	1,159 75	776 62	873 84	1,263 15	2,136 99	–	7,752 91	8,000 81
Hampshire, .	600 00	156 18	251 00	–	1,007 18	641 00	484 95	450 42	300 00	850 00	–	3,486 01	3,486 01

Hampden, .	600 00	163 15	65 00	485 43	1,313 58	884 75	564 50	626 63	925 83	1,552 46	-	3,350 00	5,122 00
Franklin, . .	600 00	224 07	1,229 10	176 25	2,229 42	589 75	484 12	388 49	455 27	-	-	4,502 17	4,502 17
Berkshire, .	600 00	168 00	127 00	162 00	1,057 00	1,005 00	1,001 00	926 00	1,037 88	937 00	-	3,000 00	5,000 00
Housatonic, .	600 00	284 00	66 00	634 06	1,584 06	898 00	815 00	815 00	1,114 78	1,756 28	3,500 00	5,786 67	9,286 67
Norfolk, . .	600 00	-	287 00	1,557 75	2,444 75	1,963 00	761 00	567 00	2,561 43	3,131 43	6,129 89	6,189 29	6,129 89
Bristol, . .	600 00	216 32	155 00	1,962 70	2,934 02	1,318 40	852 50	852 50	1,647 31	2,499 81	-	3,240 00	3,240 00
Plymouth, .	600 00	703 00	45 00	300 00	1,648 00	1,059 75	775 25	666 50	400 00	1,575 00	-	9,850 00	9,850 00
Barnstable, .	348 00	103 80	80 00	-	533 80	435 50	264 37	264 37	265 00	529 37	-	1,910 00	2,160 00
Totals, .	10,188 00	6,266 21	6,604 10	8,268 89	30,729 20	16,281 89	10,694 97	10,311 90	12,899 35	29,353 11	27,929 89	99,193 35	124,205 49

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* Paid Thomas Motley, Jr., for care of Society's stock.

† $420 received by a special resolve of the last Legislature; the remainder, $420, received from the Commonwealth for the year.

PERMANENT FUND—HOW INVESTED.

Massachusetts.—Stock in Boston Banks.
Essex.—Bank stock, bonds and notes secured by mortgages.
Middlesex.—Bank stock, notes, railroads and mortgages.
Midddlesex South.—Real Estate, bank stock and cattle pens.
Worcester.—Bank stock, notes and real estate.
Worcester West.—In notes of hand and cattle pens.
Worcester North.—Notes of hand, cattle pens, and implements for use of Society.
Hampshire, Franklin and Hampden.—Notes secured by mortgages and personal securities.
Hampden.—Promissory notes, secured by real estate and otherwise.
Franklin.—Notes well secured.
Hampshire.—Loans on mortgages of real estate, $2,483.29; loans on notes bearing interest, $207.50; subscribers on life member's notes on interest—good, $263; other loans on interest, $283.16; doubtful, $80.50.
Berkshire.—In personal securities.
Housatonic.—Notes of hand against individual members on annual interest.
Norfolk.—In land, agricultural hall, cattle pens, fixtures, furniture, &c., at cost.
Bristol.—Stock of Taunton Bank; notes of Bristol county.
Plymouth.—31 shares of Plymouth Bank, $3,100; 3 shares North American Bank, $300; 5 shares State Banking Company, $300; 2 bonds Cape Cod Railroad, $700; 7 promissory notes, $5.450.
Barnstable.—2 notes of hand considered good, $1,850; in Barnstable Savings Institution, $1,910.

RETURNS OF AGRICULTURAL SOCIETIES FOR 1854.

ANALYSIS OF PREMIUM AND GRATUITIES AWARDED.

FOR FARMS, &c.

SOCIETIES.	For management of farms.	For draining.	For subsoil ploughing.	For ploughing at exhibition.	Reclaiming meadow lands.	For manures and experiments with them.	For orchards of all kinds.	For improvements on farm.	Amount offered for farm improvem'ts.	Amount awarded for farm improvements.	Amount paid for farm improvem'ts.
Essex, . . .	–	–	–	$82 00	–	–	–	$29 00	$431 00	$111 00	$326 00
Middlesex, . .	$37 00	–	–	84 00	$20 00	–	$28 00	15 00	199 00	184 00	118 00
Middlesex S., .	–	–	–	70 00	45 00	–	–	–	245 00	25 00	–
Worcester, . .	25 00	$200 00	–	88 00	–	–	–	–	155 00	25 00	25 00
Worcester W., .	8 00	–	–	36 00	–	$6 00	–	–	48 00	8 00	8 00
Worcester N., .	–	–	–	32 00	–	9 00	–	15 00	25 00	24 00	24 00
Hampsh'e, Frank. & Hamp., .	35 00	–	$5 00	50 00	–	5 00	21 00	–	247 00	109 00	109 00
Hampshire, . .	30 00	–	–	33 00	18 00	10 00	16 00	–	136 00	107 00	105 00

Hampden, . .	-	-	-			-	18 00	-	-	-	-
Franklin, . .	-	-		18 50	11 00	-	-	-	-	-	-
Berkshire, . .	-	-	-	60 00	13 00	-	20 00	-	-	-	-
Housatonic, . .	-	-	-	56 00	30 00	-	24 00	-	30 00	30 00	30 00
Norfolk, . .	-	-	-	71 00	15 00	-	15 00	36 00	414 00	137 00	146 00
Plymouth, . .	-	-	-	56 75	-	38 00	30 00	-	154 75	117 75	70 00
Bristol, . . .	-	-	-	72 00	-	-	-	-	351 00	72 00	72 00
Barnstable, . .	-	-	-	12 00	6 00	8 00	-	-	71 00	14 00	14 00
Totals, . .	$135 00	$200 00	$5 00	$827 25	$158 00	$76 00	$172 00	$95 00	$2,506 75	$963 75	$1,047 00

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.—CONTINUED.

FOR FARM STOCK.

SOCIETIES.	Bulls.	Working Oxen.	Milch Cows.	Heifers and Calves.	Fat Cattle & Steers.	Horses.	Swine.	Sheep.	Poultry.	All other stock.	Total offered for live stock.	Total awarded for live stock.	Total paid out for live stock.
Massachusetts, . .	-	-	$300 00	-	-	-	-	-	-	-	-	-	-
Essex, ...	$21 72	$28 00	40 56	$32 00	$25 08	$111 00	$27 40	$6 00	$26 25	$29 36	$340 00	$347 37	$275 68
Middlesex, . . .	49 00	20 00	44 00	30 00	14 00	29 00	21 00	-	7 00	9 00	400 00	223 00	140 00
Middlesex S., . .	48 00	19 00	54 00	49 00	8 00	41 00	37 00	5 00	15 00	63 00	358 00	339 00	-
Worcester, . . .	49 00	43 00	45 00	61 00	45 00	153 00	43 00	16 00	28 00	69 00	721 00	545 00	545 00
Worcester W., . .	26 00	50 00	14 00	36 00	45 00	37 00	40 00	5 00	10 00	24 00	353 00	296 00	264 50
Worcester N., . .	26 00	14 00	12 00	37 00	23 00	37 00	29 50	4 50	8 00	30 50	240 50	221 50	196 53
Hamp., Frank. & Hampd.	28 00	106 00	26 00	35 50	35 00	89 00	45 00	16 00	33 50	54 50	443 00	468 50	430 17
Hampshire, . . .	20 00	39 00	20 00	14 00	12 00	40 00	19 00	6 00	5 00	18 00	209 00	193 00	177 50
Hampden, . . .	32 00	134 00	11 00	14 00	55 00	78 00	39 00	19 00	8 00	1 50	444 50	391 50	-

Franklin, . . .	25 00	27 00	23 00	10 00	44 00	52 00	25 00	27 00	5 00	40 00	314 50	278 00	263 12
Berkshire, . . .	22 00	60 00	54 00	28 00	–	73 00	27 00	81 00	25 00	41 00	411 00	–	411 00
Housatonic, . . .	31 00	29 00	36 00	21 00	13 00	75 00	23 00	57 00	6 00	70 00	358 00	361 00	361 00
Norfolk, . . .	43 00	22 00	83 00	36 00	8 00	68 00	51 00	5 00	44 00	9 00	401 00	372 00	229 00
Bristol, ...	38 00	82 00	27 00	22 50	123 00	–	43 00	–	23 00	–	444 00	358 50	358 50
Plymouth, . . .	40 00	45 75	21 00	25 75	45 50	33 50	20 00	–	20 00	–	302 00	246 00	221 75
Barnstable, . . .	15 00	9 00	5 00	10 00	15 00	29 00	24 00	10 00	–	14 00	171 50	131 00	131 00
Totals, . . .	$513 72	$727 75	$815 56	$461 75	$510 58	$945 50	$516 90	$257 50	$263 75	472 86	5,911 00	4,771 37	4,004 75

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.—CONTINUED.

FOR FARM PRODUCTS.

SOCIETIES.	Indian Corn.	Wheat.	Rye.	Barley.	Oats.	Other Grain Crops.	Grass Crops.	Potatoes.	Carrots.	Beets.	Turnips.
Essex,	$6 00	$6 00	–	–	–	–	–	$6 00	$6 00	Onions. $6 00	$6 00
Middlesex,	15 00	10 00	$10 00	–	–	–	–	–	–	–	–
Middlesex S.,	–	–	–	–	–	–	–	3 87	–	1 12	–
Worcester,	–	–	–	–	–	–	–		15 00	–	–
Worcester W.,	–	–	–	–	–	–	–	–	–	–	–
Worcester N.,	15 00	–	3 00	–	$3 00	–	–	5 87	5 00	25 00	–
Hampshire, Frank. and Hampd.,	11 00	–	5 00	–	–	–	–	2 00	25	75 00	–
Hampshire,	8 00	5 00	6 00	–	3 00	–	$4 00	5 00	2 00	–	3 00
Hampden,	2 50	–	–	–	–	–	–	3 75	5 00	1 75	2 25
Franklin,	3 00	7 00	–	–	–	–		–	2 00	–	2 00

Berkshire,	47 00	32 00	14 00	14 00	20 25	-	-	9 00	6 00	-	6 00
Housatonic,	43 00	26 00	20 00	-	12 00	19 00	9 00	20 00	6 00	-	-
Norfolk,	16 00	-	-	-	-	-	-	-	-	-	-
Bristol,	33 00	-	-	6 00	-	Beans. 10 00	-	-	-	-	13 00
Plymouth,	59 00	7 00	14 00	8 00	8 00	10 00	-	1 00	15 00	-	8 00
Barnstable,	6 00	3 00	4 00	2 00	-	Seed corn. 50	-	1 50	-	50	25
Totals,	$264 50	$96 00	$76 00	$30 00	$46 25	$39 50	$13 00	$57 99	$62 25	$109 37	$40 50

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.—CONTINUED.

FOR FARM PRODUCTS.

SOCIETIES.	Other Root Crops.	Amount offered for Root and Grain Crops.	Amount awarded for Root and Grain Crops.	Amount paid out for Grain and Root Crops.	Amount awarded for Broom Corn.	Any other cultivated crops.	Fruits and Flowers.	Milk.	Butter and Cheese.	Bread and Flour.
Essex, ...	Cabbages. $6 00	$114 00	$42 00	$56 50	–	–	$67 50	Specimens of vegetables. $55 00	$44 00	–
Middlesex, ...	–	44 00	35 00	35 00	–	Vegetables. $29 00	94 75	–	–	$21 00
Middlesex S., ...	19 62	103 00	–	–	–	–	63 25	–	11 00	–
Worcester, ...	–	59 00	15 00	15 00	–	–	–	*35 00	56 00	–
Worcester W., ...	–	58 00	–	–	–	–	17 00	–	51 00	–
Worcester N., ...	–	41 00	32 12	26 00	–	12 25	42 16	–	17 00	–
Hamp., Frank. and Hampd., .	–	69 00	69 00	40 00	$11 50	8 50	43 25	–	21 00	19 00
Hampshire, ...	–	50 00	36 00	36 00	6 00	11 55	13 75	–	25 50	–
Hampden, ...	–	137 25	46 25	–	4 00	–	50 50	–	26 00	–
Franklin, ...	2 00	59 00	23 00	–	9 00	–	21 25	–	11 50	–

Berkshire,	–	173 00	173 00	173 00	–	32 00	–	–	32 00	–
Housatonic,	9 00	167 00	164 00	164 00	–	3 00	57 00	5	36 00	–
Norfolk,	15 00	–	31 00	62 00	–	6 00	62 00	–	60 00	–
Bristol,	–	211 00	62 00	62 00	–	–	158 00	–	–	Honey. 33 75
Plymouth,	Onions. 5 00	184 00	134 00	102 50	–	–	63 75	–	50 00	6 00
Barnstable,	50	57 00	18 25	18 25	–	7 75	9 00	–	15 00	–
Totals,	$57 12	$1,526 25	$880 62	$790 25	$30 50	$110 05	$763 16	$90 00	$456 00	$79 75

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* Amount awarded for products of Dairy.

MISCELLANEOUS.

SOCIETIES.	Amount awarded for Agricultural implements.	Amount awarded for all other Agricultural objects.	Amount awarded for objects other than Agricultural.	Number of persons who have received Premiums and Gratuities for Agricultural objects.
Essex,	$60 00	Essay. $10 00	$146 00	180
Middlesex,	3 00	–	39 00	132
Middlesex S.,	10 00	538 00	105 37	127
Worcester,	–	7 49	3 00	79
Worcester W.,	3 00	–	57 75	117
Worcester N.,	2 25	–	51 25	149
Hamp., Frank. & Hampd.,	17 00	–	109 12	160
Hampshire,	6 55	56 25	39 55	207
Hampden,	11 00	5 50	101 25	100
Franklin,	5 00	–	69 75	245
Berkshire,	6 00	–	105 00	253
Housatonic,	–	–	84 00	203
Norfolk,	21 00	–	54 00	102
Bristol,	–	34 50	133 75	171
Plymouth,	5 00	770 25	–	357
Barnstable,	4 25	–	53 12	48
Totals,	$154 05	$1,421 99	$1,151 91	2,630

Names of Towns and Cities in which Premiums and Gratuities for Agricultural objects were distributed by each Society, and amount to each town.

ESSEX.

Amesbury,	$25 75	Lynnfield,	$1 50
Andover,	210 51	Marblehead,	34 00
Boxford,	20 40	Methuen,	27 50
Beverly,	9 00	Middleton,	23 26
Bradford,	21 48	Newbury,	30 08
Boston,	10 00	Newburyport,	16 50
Danvers,	91 55	Rowley,	7 75
Essex,	10 00	Salem,	9 00
Georgetown,	13 20	Salisbury,	1 00
Groveland,	12 00	Topsfield,	27 65
Hamilton,	8 00	Wenham,	3 50
Haverhill,	41 79	West Newbury,	3 70
Lawrence,	78 25	Totals,	$737 37

MIDDLESEX.

Ashby,	$30 00	Charlestown,	$2 00
Acton,	24 50	Chelmsford,	2 00
Brighton,	3 00	Dracut,	5 00
Billerica,	1 00	Framingham,	39 50
Bradford,	50	Groton,	45 00
Concord,	203 50	Lowell,	28 00
Cambridge,	10 00	Littleton,	19 50

MIDDLESEX—CONTINUED.

Lincoln,	$18 50	Somerville,	$1 00
Lexington,	6 00	Wilmington,	26 50
Malden,	12 00	Wayland,	22 00
Reading,	5 00	Watertown,	18 00
Sudbury,	32 00	Waltham,	12 25
South Reading,	19 00	Totals,	$589 75
Shirley,	4 00		

MIDDLESEX SOUTH.

Ashland,	$2 25	Sherburn,	$42 50
Framingham,	301 00	Southboro',	40 25
Holliston,	3 00	Sudbury,	31 50
Hopkinton,	16 50	Wayland,	30 50
Marlboro,'	52 00	Total,	$548 00
Natick,	28 00		

WORCESTER.

Auburn,	$13 00	Leicester,	$24 00
Barre,	147 00	Millbury,	13 00
Berlin,	8 00	New Braintree,	18 00
Boylston,	18 00	Northboro',	8 00
Charlton,	9 00	Oakham,	5 00
East Brookfield,	6 00	Oxford,	16 00
Grafton,	36 00	Princeton,	108 00
Harwick,	10 00	Shrewsbury,	12 00
Holden,	8 00	Sterling,	9 00

WORCESTER—Continued.

Sturbridge,	$27 00	West Boylston,	$39 00
Sutton,	75 00	Westboro',	49 00
Upton,	1 00	Worcester,	225 00
Uxbridge,	7 00	Total,	$897 00
Warren,	6 00		

WORCESTER WEST.

Athol,	$3 00	Oxford,	$2 00
Barre,	205 00	Petersham,	52 00
Bernardston,	4 00	Princeton,	44 00
Hardwick,	19 00	Phillipston,	5 00
Hubbardston,	9 00	West Brookfield,	2 00
New Braintree,	33 00	Worcester,	2 00
North Brookfield,	5 00	Total,	$392 00
Oakham,	7 00		

WORCESTER NORTH.

Ashby,	$25 27	Sterling,	$17 46
Ashburnham,	8 37	Shirley	5 00
Fitchburg,	203 48	Templeton,	3 00
Gardner,	3 00	Westminster,	25 37
Leominster,	7 12	Winchendon,	1 50
Princeton,	81 45	Total,	$381 02

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Amherst,	$19 50	Leverett,	$8 00
Belchertown,	4 00	Montgomery,	1 00
Conway,	17 00	Northampton,	300 57
Chester,	2 00	Norwich,	25 92
Chesterfield,	1 00	Southampton,	49 87
Deerfield,	17 04	South Hadley,	40 55
Easthampton,	19 25	Sunderland,	6 50
Granby,	21 00	Westfield,	44 12
Goshen,	5 00	Whately,	11 50
Hadley,	151 40	Williamsburg,	4 00
Hatfield,	11 50	Westhampton,	2 12
Heath,	12 00	Total,	$774 84

HAMPSHIRE.

Amherst,	$140 00	Northampton,	$11 90
Belchertown,	17 10	New Salem,	5 00
Chester,	75	New York,	20
Conway,	2 00	Pelham,	6 25
Deerfield,	10 50	Prescott,	2 65
Erving,	4 00	Shutesbury,	5 00
Granby,	35 60	South Hadley,	11 25
Greenwich,	3 00	Springfield,	3 00
Hadley,	78 95	Sunderland,	128 55
Leverett,	12 50	Whately,	25
Montague,	6 50	Total,	$484 95

HAMPDEN.

Blandford, ...	$1 00
Chicopee, ...	30 50
Longmeadow, . . .	53 00
Southwick, . . .	1 00
Springfield, . . .	274 50
Westfield, . . .	$72 75
West Springfield, . .	67 50
Wilbraham, . . .	64 25
Total, ...	$564 50

FRANKLIN.

Ashfield, ...	$1 00
Bernardston, . . .	28 25
Conway, ...	7 00
Coleraine, ...	6 12
Deerfield, ...	77 60
Erving, ...	2 00
Greenfield, . . .	80 50
Gill, ...	5 75
Heath, ...	6 25
Leyden, ...	$9 00
Montague, . . .	5 50
Northfield, . . .	20 25
New Salem, . . .	16 32
Orange, ...	2 00
Sunderland, . . .	16 20
Shelburne, . . .	110 75
Total, ...	$394 49

BERKSHIRE.

Adams, ...	$11 00
Becket, ...	7 00
Cheshire, . . .	65 00
Dalton, ...	32 00
Egremont, . . .	26 00
Great Barrington, . .	43 00
Hinsdale, ...	3 00
Hancock, ...	2 00
Lanesboro', . . .	$191 00
Lenox, ...	61 00
Lee, ...	38 00
Monterey, . . .	19 00
New Marlboro', . .	14 00
Other towns, . . .	12 00
Pittsfield, ...	246 50
Peru, ...	3 00

BERKSHIRE—Continued.

Richmond,	$27 00	Windsor,	$18 00
Stockbridge,	102 00	Williamstown,	15 00
Sheffield,	42 50	Totals,	$989 00
West Stockbridge,	21 00		

HOUSATONIC.

Alford,	$13 00	Pittsfield,	$10 00
Dalton,	7 00	Richmond,	10 00
Egremont,	131 00	Sheffield,	124 00
Great Barrington,	249 00	Stockbridge,	64 00
Lenox,	40 00	Sandisfield,	16 00
Lee,	15 00	Tyringham,	3 00
Lanesboro',	1 00	West Stockbridge,	35 00
Monterey,	77 00	Totals,	$815 00
New Marlboro,'	20 00		

NORFOLK.

Braintree,	$62 00	Others,	$54 00
Brookline,	11 00	Quincy,	31 00
Canton,	17 00	Roxbury,	9 00
Dorchester,	114 00	Randolph,	5 00
Dedham,	108 50	Stoughton,	7 00
Dover,	41 00	West Roxbury,	70 50
Medfield,	58 00	Walpole,	1 00
Medway,	32 00	Wrentham,	45 00
Milton,	29 00	Total,	$761 00
Needham,	66 00		

BRISTOL.

Attleboro',	$36 00	Norton,	$65 50
Berkley,	12 50	Raynham,	66 50
Dartmouth,	68 00	Seekonk,	78 00
Fall River,	51 50	Somerset,	19 00
Fairhaven,	36 50	Swanzey,	16 00
Freteown,	18 50	Taunton,	93 50
Falmouth,*	3 00	Westport,	28 00
Mansfield,	34 00	Total,	$773 25
New Bedford,	146 75		

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* Not in the County—Gratuity.

PLYMOUTH.

Abington,	$5 75	Mansfield,	$3 50
Bridgewater,	319 00	North Bridgewater,	41 50
Carver,	18 00	Pembroke,	16 00
Duxbury,	6 25	Plympton,	18 50
East Bridgewater,	54 75	Plymouth,	24 75
Halifax,	34 00	Rochester,	7 00
Hanson,	18 00	Scituate,	3 00
Hingham,	5 75	South Scituate,	3 00
Kingston,	5 25	Unknown,	2 00
Lakefield,	2 00	West Bridgewater,	83 25
Middleboro',	104 00	Total,	$775 25

BARNSTABLE.

Barnstable,	$169 12	Harwich,	$15 75
Brewster,	4 25	Orleans,	6 00
Chatham,	3 00	Sandwich,	26 00
Dennis,	19 00	Yarmouth,	18 75
Eastham,	1 00	Total,	$264 37
Falmouth,	1 50		

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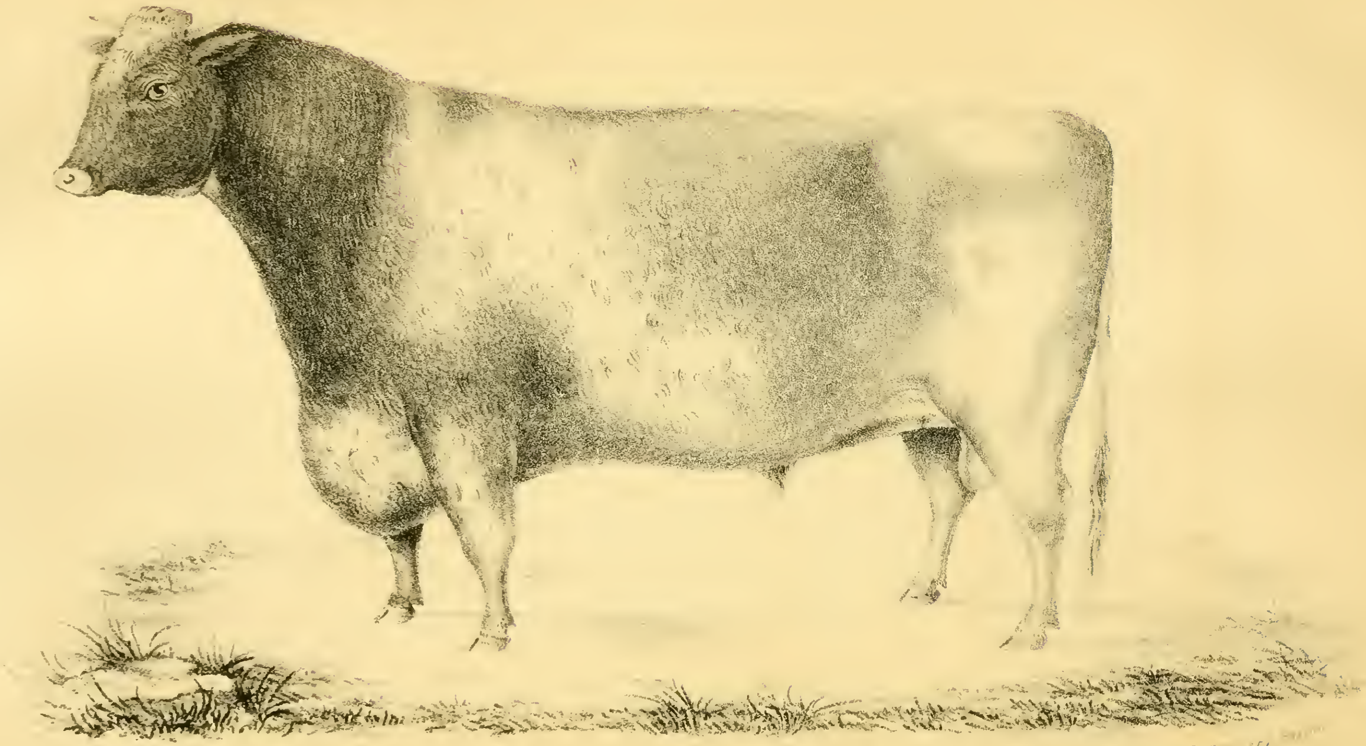
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FIRST PRIZE SHORT HORN. KIRKLEAVINGTON 1st (11640)

5 Years old *See page 253.*

Owned by Messrs. Atwater, Lathrop & Clark.

THE

AGRICULTURE OF MASSACHUSETTS,

AS

SHOWN IN RETURNS

OF THE

AGRICULTURAL SOCIETIES,

1854.

EDITED BY

CHARLES L. FLINT,

Secretary of the Board of Agriculture.

BOSTON:
WILLIAM WHITE, PRINTER TO THE STATE.
1855.

PREFACE.

A CAREFUL examination of the returns of the Agricultural Societies shows the importance of such revision in the method of awarding premiums as to increase the efficiency and influence of the bounty of the State. The details of the system, though proper enough at the outset, have not, in all cases, been adapted to the exigencies of the times; and the influence of the society in such cases has not reached so far as to awaken an interest in the subject where little existed before, or to spread information by means of carefully prepared Transactions distributed all over the county.

The agricultural bounty, small as it is, has without doubt been of great and lasting good to the Commonwealth. This was to be expected. But no society can accomplish the highest good of which it is capable without constant and unremitting efforts to excite and keep alive the spirit of progress; and the result of these efforts should be seen on the fields of every farmer in the county. One mode of doing this is by the publication and distribution of reports, prepared with care and full of practical information, among all the farmers within the limits of the society, whether members or not.

All but two of the societies have published their Transactions for the past year. It is to be hoped there will be no exception to this rule hereafter.

The practice prevailing in a few societies, of awarding premiums twice on the same article, or, in some cases, of taking the premium on the same article at two or three different societies, has given rise to much very just complaint, and should have been remedied by the by-laws of all the societies at its inception; for while the affairs of any society are managed in a manner which does not commend itself to the good sense and good judgment of honest men, all good influences are paralyzed, and men lose confidence in the disinterested purposes of the society, and cherish prejudices which ought not to exist. To remedy these evils, the present Legislature has passed the following Act:—

Sect. 1. No incorporated agricultural society, receiving the bounty of this Commonwealth according to the provisions of chapter forty-two of the Revised Statutes, shall distribute any part thereof to any person, as first premium, for any animal or article for which a first premium shall have been awarded by that or any other incorporated society.

Sect. 2. No incorporated agricultural society receiving the bounty of this Commonwealth shall award from such bounty any second or third premium to any person for any animal or article which shall have received the same premium from any other incorporated society the same year.

Sect. 3. No incorporated agricultural society receiving the bounty of the Commonwealth, which shall hereafter disregard the prohibitions of this act, shall be entitled to receive any part of said bounty for that year.

Sect. 4. Nothing in this act shall be held to prohibit any animal or article which receives a lower premium from being entered with another society, or with the same society, on a succeeding year, for a higher premium.

It was evidently the intention of the law that the funds of each society receiving the bounty of the State should be actually contributed, paid in, and put at interest; whereas, in some instances, societies have been satisfied with the promissory notes of new members, and these notes, taken in the aggregate, form what is called the permanent fund. I am aware of all the reasons urged in favor of this course; but, however necessary it may seem to be, it can hardly be regarded in any other light than an evasion of the law, and no society should include property so invested as a part of its permanent fund.

Much greater care is needed in the preparation of the reports of committees; and if some system should be matured and adopted previous to the exhibition and adhered to by them, more valuable results would be arrived at and more information of general interest obtained, and, what is of nearly equal importance, the Transactions could be ready more promptly for distribution.

This is not the place to enter into the details of the management of a county society; and yet it is from details like these that its whole efficiency and aggregate influence are made up, while their importance has been repeatedly urged upon my attention during the preparation of this volume, and so strongly as to seem to warrant this occasion to call attention to them.

I am indebted to several individuals who have kindly furnished me with the plates of animals and buildings which adorn the following pages.

The arrangement of the materials of which the present volume is composed is in the main the same as that of last year, which, on the whole, was found to be both more logical and convenient for reference than any other which could be adopted. A complete index will be found at the end.

The financial returns of the societies will be found in the Appendix to the Second Annual Report of the Secretary of the Board of Agriculture.

C. L. FLINT.

Boston, April, 1855.

OFFICERS OF AGRICULTURAL SOCIETIES,

1855.

MASSACHUSETTS.

President—JOHN C. GRAY, of Boston.
Secretary—BENJAMIN GUILD, of Boston.

ESSEX.

President—MOSES NEWELL, of West Newbury.
Secretary—ALLEN W. DODGE, of Hamilton.

MIDDLESEX.

President—SAMUEL CHANDLER, of Lexington.
Secretary—SIMON BROWN, of Concord.

MIDDLESEX SOUTH.

President—WILLIAM BUCKMINSTER, of Framingham.
Secretary—C. C. ESTY, of Framingham.

WORCESTER.

President—JOHN BROOKS, of Princeton.
Secretary—WILLIAM S. LINCOLN, of Worcester.

WORCESTER WEST.

President—DAVID LEE, of Barre.
Secretary—EDWIN WOODS, of Barre.

WORCESTER NORTH.

President—MOSES WOOD, of Fitchburg.
Secretary—THOMAS R. BOUTELLE, of Fitchburg.

HAMPSHIRE, HAMPDEN AND FRANKLIN.

President—PAOLI LATHROP, of South Hadley.
Secretary—JOHN W. WILSON, of Northampton.

HAMPSHIRE.

President—W. P. DICKINSON, of Hadley.
Secretary—J. W. BOYDEN, of Amherst.

HAMPDEN.

President—FRANCIS BREWER, of Springfield.
Secretary—A. A. ALLEN, of Springfield.

FRANKLIN.

President—HENRY W. CUSHMAN, of Bernardston.
Secretary—E. F. RAYMOND, of Greenfield.

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President—JULIUS ROCKWELL, of Pittsfield.
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President—HENRY SMITH, of Lee.
Secretary—JAMES SEDGWICK, of Great Barrington.

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President—MARSHALL P. WILDER, of Dorchester.
Secretary—EDWARD L. KEYES, of Dedham.

BRISTOL.

President—J. H. W. PAGE, of New Bedford.
Secretary—L. T. TALBOT, of Taunton.

PLYMOUTH.

President—BENJAMIN HOBART, of Bridgewater.
Secretary—JESSE PERKINS, of North Bridgewater.

BARNSTABLE.

President—CHARLES MARSTON, of Barnstable.
Secretary—GEORGE MARSTON, of Barnstable.

AGRICULTURE OF MASSACHUSETTS.

The field of most agricultural operations is the farm. In the arrangement of this work, therefore, the general system of farm management in the State, and the improvements which have been made in it during the past year, seem first to claim our attention. The frequent visits of the various societies to the most skilfully conducted farms of each county by means of their committees, and the faithful records of these visits, containing suggestions of great practical value, bring to the knowledge and consideration of all the best and most approved practices prevailing in every part of the Commonwealth.

Following the order of counties adopted by the Legislature from time immemorial, we have first the report of the Essex Society on the improvement of

FARMS.

From the Report of the Committee.

The committee have had nothing to do under that branch of their commission that contemplates the award of premiums at the expiration of *three years.*

They have visited a few farms in West Newbury, Marblehead, Danvers, and Lynn, but not enough to enable them to speak with confidence of observations made on such visits. One of their number has looked at several farms in the extreme eastern section of the county,—a region that has heretofore been little noticed in our transactions,—and herewith submits the result of his observations. If the same thing could have been done by each member of the committee in his own neighborhood, and if such observations could be continued for a term of three years, a mass of information of much value might be accumulated.

The truth is, farm operations need to be viewed by discriminating, careful, and disinterested observers. Statements of experiments or products from the parties interested alone are not always to be relied on with entire confidence.

Whether the present offer of premiums on farms shall be continued, it remains for the Trustees to determine.* No harm will accrue from a modification of it, if any improvement can be suggested. In its present form, and as at present regarded, it is of little practical benefit. If one or more farms could be entered and examined for three successive years in each of the principal farming towns of the county—say Newbury, Ipswich, Salem, Andover, and Haverhill—as they were in olden time, much benefit might accrue. But, to have this faithfully done, the incidental expenses of travel incurred by the Viewing committee should be met by the Society. The tax of time spent is quite enough to demand of individuals.

J. W. PROCTOR, *Chairman.*

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* The offer of premiums on farms was made prospective, extending over a period of three years. It was in the following words:—

For the best conducted and most improved farm during the ensuing three years, taking into view the entire management and cultivation for that period, including lands, buildings, fences, orchards, crops, stock, and all other appendages, with statements in detail relating thereto,—

First premium, ...	$100 00
For the second best, ...	50 00

NOTE.—Competitors for these premiums must give notice of their intention to the Secretary on or before the 15th of June next, and the farms entered for premiums will be viewed by the committee twice in each year. Any person desirous of having his farm inspected, without entering the same for premium, may make application to the Secretary, and it will be viewed and reported upon by the committee.

Letter to the Committee on Farms.

HON. J. W. PROCTOR, *Chairman, &c.*:—

Dear Sir:—Having unfortunately been denied the pleasure of visiting, with the committee, the farm of Col. Newell at West Newbury, and of Mr. Ware at Marblehead, I accepted your invitation to visit a few of those in this vicinity as my engagements have permitted. I believe that to yourself belongs the honor of having originated the plan of visiting farms known to be well managed, but not offered for premium through the modesty of the owner. There are certainly but few men in our country, who, like Mr. Mechi, of Tiptree, in England, would wish to "invite inspection, in order, by the force of example, to give an impulse to improved cultivation." It will be long, no doubt, before three hundred or three hundred and fifty gentlemen farmers and statesmen, from remote parts of the country, will be drawn together among us to see the crops and the mode of management upon any farm, as was the case a few months ago at the above-mentioned place. Not that I think the English farmer has all the advantage on his side. It is said he makes some failures—goes to work expensively sometimes; and it seems to be intimated that, with all the good he has done, his balance-sheet does not always exhibit the most abundant income. Neither, since calling on some of our farmers, am I willing to admit that Mr. Mechi is the only man who can take his visitors, few or many, from field to field, "explaining every thing upon which information is desired"—not the only one who can, while making the round of the farm, "deliver a succession of peripatetic lectures on almost every point connected with agriculture." There are good humor and volubility among American farmers, you may depend, as well as over the water; and if Mr. Mechi's "field preaching is worth travelling a long distance to listen to," so have I found it in some of our own county, and that, too, without even so much of a mixture of forth-putting as to allow them to do more than merely consent to a visit actually sought by the committee as a privilege.

The only objection to this mode of obtaining information is one that cannot, from the nature of the case, be avoided; viz., the want of perfect accuracy in stating the amount produced or the amount of manure applied. The visits of the committee are made while the crops are growing, so that the amount of grain or grass upon an acre cannot be determined. This, however, does not preclude the possibility of obtaining the most important information. And, without extending these general remarks, I will proceed to say, that on the 10th of September I visited the farm of Dr. Boyden, at West Beach, in Beverly. The tenant is Lyman Mason, and he has been upon it eight years. It was a farm of fifty acres till last year, when eighteen acres were sold. Its previous condition I did not learn. Its present state, however, I wish I were able to describe. Mr. Mason hires his son and a boy constantly, but no other help except by day's work in haying time and harvesting. He usually obtains about fifteen loads of night soil as a stimulant to give his crops a start, and has sometimes paid as high as forty dollars a year for stable manure; but his chief reliance is upon the *drift stuff from the beach.* The amount of the most admirable manure, chiefly eel grass, obtained and applied, he was not able to state; but he dresses his lands with thirty ox-loads to the acre—I mean a team of one pair of oxen. It costs him four cents a load at the beach. A small part of it is kept over winter in the yard, to be used in the hill for corn and potatoes. The effect of the manure (the seaweed) is admirable in resisting the drought. While almost every other farm was exhibiting the yellow hue, this one was green and gladsome. I was satisfied that Mr. Mason's three acres of corn had eighty bushels to the acre—I think more rather than less. The ground was in potatoes and squashes last year, and had been under the plough four years.

Mr. Mason has about one acre of cabbages, with about four thousand handsome heads, worth from five to ten cents each in the market; suppose seven cents on an average, and we have two hundred and eighty dollars for that acre. He has also one and a half acres of onions, and has cut, he says, thirty tons of English hay this year, and raised one hundred and fifty bushels of rye. The garden proper is large, but not measured. I have alluded to the necessary want of accuracy in the case, and can only speak in general terms; yet, when he says that he gathered twenty-two dollars' worth of melons in one day; that he should not realize more than four hundred and fifty bushels of onions to the acre, on account of the drought, which that crop feels sensibly; that there are a dozen long red potatoes in a hill of noble size,—I can very well believe it all, because I saw, when upon the ground and at the house, melons enough for several more such days of picking; onions enough to make well nigh or quite four hundred and fifty bushels; and potatoes answering the manifest fully, when the hills were opened to me.

The stock kept upon the farm consists of one cow, one heifer, four oxen, one bull, two horses, two shotes; from which it will at once be seen that the manure must come chiefly *from some other source.* The manure of Dr. Boyden's farm comes chiefly from the sea-shore. This is the text—the farm itself the comment. Now, while it is obvious that but a small part of our farmers can have access to this source of fertilization, it is nevertheless strange that so little account is made of it when they can. The evidence to my mind is inevitable, that for resisting drought there are few manures, if any, like this. I do not pretend to have given the full account of the crops upon this farm. As my visit was necessarily short, I will close my account of it by expressing the hope that, should the society send out a committee next year, they will make it a point to visit Mr. Mason and report his doings at length.

My second visit was to the farm of Burley Smith, of Manchester, an aged but vigorous gentleman, who showed me the only house in Manchester that was painted when he settled there, and that was painted with fish oil and Spanish brown! I ought to say that, with all the beauty of Mr. Smith's farm, he would not probably claim for it the title of a fancy farm any more than would Dr. Boyden for his; but, for profit, few will compare with either.

Like the West Beach farm last described, this is manured mostly from the sea. Mr. Smith thinks he gets about five hundred tons of eel grass and rockweed from his half mile of beach annually. Formerly his inner shore abounded with muscle-bed mud; but he does not choose to draw too freely upon that, in hopes to have it extend itself; yet he takes up from fifty to one hundred loads a year of that fat manure. Only seven acres of this noble farm of two hundred acres are in salt marsh, and seventy in pasture; all the rest are tillage and mowing, with some woodland. Formerly one man (himself) carried on the whole; but recently he has divided it into three parts, thus making three pretty distinct farms. Nearly one-third of all the tillage land is in gardens. Two acres are in onions—probably four hundred barrels on these two. The grass land shows the strength of sea stuff. Mr. Smith informed me that he had cut three tons of well-made hay upon a measured acre at one crop, and it would average two. Six tons of carrots are an average crop, and so are sixty bushels of Indian corn. Upon the whole farm, viz., the three divisions of it, there are kept but eight oxen, three horses, and eight to ten cows—thus showing that, when farmers will avail themselves of surrounding facilities for making manures, the crops need not be consumed on the farm for that purpose, but may be sold at market and turned to ready money. I have said that this farm is one for profit, and not for the looks alone. I ought to say that, notwithstanding the venerable owner has expended some seventy-five hundred dollars upon his buildings since he bought the place, he is just about putting up other and new ones, and pleasantly suggested that the full committee had better suspend their visit until he should have put his farm into a shape more agreeable to himself.

Mr. Smith invited me to visit his reclaimed meadow of seven acres; and, as might be expected, it was his most productive land, although reclaimed thirty years ago. This reminds me of a noble example of the same kind which I inadvertently omitted in speaking of the farm at West Beach. That was one of fourteen acres, and though full of stumps of trees of gigantic growth, alders, and standing or stagnant water, yet it *pays*—as would almost any meadow any where.

Mr. Smith received my visit most cordially, though entirely unsought and unexpected by him; and my reflection on leaving his noble farm and his excellent company was, that, with all the dignity and eloquence of our regular-built cattle-show addresses, there is something rich and fascinating, as well as instructive, in a field lecture, where every statement can be verified by pointing at the crop itself on the spot. And if it is but a poor account, after all, that we are able to convey to others upon paper, for want of the data, which the reader always demands, yet the defect is well made up to the sense of sight in those who will take the trouble to visit such farms as the two above mentioned.

I regret not to have found time to see the farm of Daniel Butler at the Cove, between Manchester and Gloucester, and those of Mr. Patch and Mr. Pierce of Gloucester. Messrs. Miles S. and Elihu Andrews, of Essex, have long been purchasing manures largely for hay crops chiefly; and the result of their experiment I should be happy to learn and communicate, but have not found the time. Future committees will, I hope, look after their farms and others in the eastern part of the county and report them at length.

DAVID CHOATE.

MIDDLESEX.

From the Report of the Committee.

Agreeably to invitation, we have inspected four farms, eight apple orchards, and three bog meadows. The more important details of what has passed under our notice will be given very briefly.

At the Gov. Gore farm, so called, in Waltham, now in the possession of Miss Greene, and under the management of Mr. Robert Murray, we witnessed some very gratifying results of science, skill and perseverance. Like most of the farms in this county, this showed very plainly the effects of the almost unprecedented drought of the season. Still this could not prevent our seeing the excellent results of Mr. Murray's management. What we were especially pleased with, and what we would commend to the imitation of our brother farmers, was the perfect *system* which was introduced into all the operations of this large farm. Amid a vast amount of work there was no guess work. The laws of agricultural science were evidently well understood and faithfully complied with. It would be difficult to find upon any farm a happier combination of the beautiful and the useful than appears under Mr. Murray's management.

The farm of Josiah Bigelow, in Groton, is an interesting instance of the judicious outlay of money in the improvement of land. From personal observation for a series of years, we can bear witness to the constant improvement in the condition of this farm. Bogs once almost impassable have been converted into firm and very productive meadows. Orchards have been planted, hills levelled, and a place naturally attractive has been made superlatively beautiful by the hand of art and labor. What we would especially commend to the attention of the farming public, is the remarkable skill displayed in the location and arrangement of the different out-buildings upon the place. "Contrivance," it has been said, "is better than hard work." We certainly think so, for here contrivances of various kinds supersede much of the labor hitherto deemed unavoidable upon a farm.

We visited in Westford the farm of Mr. L. H. Hildreth, the same which took the second premium of this society last year. The owner of this farm is illustrating, not so much the "pursuit" as the application of "knowledge under difficulties," inasmuch as he applies himself personally to his laborious work. Much credit is due to Mr. Hildreth for his good judgment and perseverance.

The farm of Mr. Francis Richardson, of Billerica, is one of great capabilities, which are just beginning to be developed under the direction of its present owner. We were somewhat surprised to find so extensive a tract of excellent land situated so near a good market, and still remaining comparatively unimproved. It is very satisfactory to know that it is not to remain so any longer.

In closing their report, your committee are happy to bear witness to the signs of increasing thrift among the agricultural portion of our community. The number of farms offered for premiums has always been very small, and we somewhat fear that our farmers are laboring under a mistake in this matter. They seem to suppose that unless great show is made upon a farm, such as wealth alone can accomplish, it is useless to enter it. This is a great mistake. The bounty of the Commonwealth, and the awards of this society, do not contemplate the mere outlay of money. The combination of economy, judgment, taste, and labor is what should be aimed at; and other things being equal, we deem that the most meritorious case in which much has been done with comparatively small means. What we most desire is to see the farmer "magnifying his office," alive to all its dignity, facilities, and excellence. Believing, as we do, that there is no profession which requires more good sense, and affords more real enjoyment, than this, we earnestly wish that farmers, as a body, would seek a higher development of their own intellectual nature, while they render their farms more and more productive.

CHARLES BABBIDGE, *Chairman.*

Statement of Josiah Bigelow.

The farm I invited you to inspect, known as the "Dana Place," in Groton, I purchased in the fall of 1849; it contained about forty-eight acres—keeping at that time one horse, one cow, and a few hens, and from it were sold yearly about eight or ten tons of hay, and sometimes a few winter apples, besides what were raised and consumed by the family. One-half of the farm had, probably, never been ploughed, but was used as mowing land, and the quality and quantity of hay was inferior. The other half was considered by most people as rather dry and poor land. The buildings were badly arranged, inconvenient, and out of order, and the whole enclosed by an old and weak rail fence. Every thing assumed an unpromising appearance except the location, which was good. I remodelled the dwelling house, added two rooms, made a dairy, cellar, and ice house in the north part, and a cistern capable of holding a supply of water sufficient for the dryest time. I have made about eighty rods of close board fence, five and six feet high, with stone underpinning, to enclose about six acres with the house and other buildings, and built a new barn, one hundred feet long, now filled with hay, with a good cellar under the whole. I have also put up a building for a granary, henery, and piggery. I have removed some unsightly elevations to fill up hollows equally unsightly, to the amount of not less than two thousand loads; have ploughed for the first time all the swales and other lands never before ploughed; and have enclosed the farm with a substantial picket fence, with a stone underpinning. I have set about one thousand fruit, besides some hundreds of forest trees, buckthorn and arbor vitæ hedges, shrubbery, &c.: and all within four years from last spring, the time I commenced my farming operations. I have also ingrafted about fifty large apple trees, out of one hundred that had ceased bearing, which give a very fair return this year. On what was considered the poorest land, I raised last year one hundred and six bushels of shelled corn to the acre, for which I obtained a premium. I have for the last two years raised not less than three hundred bushels of shelled corn, and expect as much this year, although an unfavorable season. I have purchased thirty acres of land, which in part has been, and the whole is intended for, a pasture, adjoining my farm, and a small wood lot at a little distance; but I have confined all my operations to about thirty acres of the first purchase, from which I have cut about all my hay, say fifty-five to sixty tons. I hope to have about six hundred bushels of carrots this year, about the quantity I have had for several years before this on the same piece of land, together with wheat, oats, corn, potatoes, &c. I do not, by any means, think my farm in a high state of cultivation, as it could profitably be made to produce one-third more than at present.

In 1852 I stall fed eleven thousand pounds of beef, and one ton of pork; in 1853, six thousand pounds of beef, and three thousand six hundred of pork; and have fed out all the hay and grain, thus far, that had been raised on the place. I hired a pasture in the town, for which I paid seventy dollars per year, this year and last. It may probably be asked how I procured manure to renovate my farm in so short a time. The first two years I purchased about twenty cords, at four dollars per cord, which I intermixed with muck, (of which I purchased an acre near by,) and of which I have used five or six hundred loads within four years, which, together with what I have been enabled to make in all ways, has amounted to a great deal each year.

I have used the meadow muck with very satisfactory results on my dryest land, and never have applied it (after removing the acidity by lime or exposure to the atmosphere) without being favorably impressed of its utility on land of sandy loam, applied with or without other fertilizing matter. I have endeavored to make manure in every possible way by giving swine a good share of loam and muck, and helping them turn it over with a fork. In this way I make three parcels in the year. The same operation is gone through with in cattle yards, and before winter sets in I have as much muck in the barn cellar as will absorb all the moisture of the droppings, and no more —as I find it lost time to cart in and out more than is wanted for that purpose. As the cellar does not freeze, the manure is worked over in stormy weather; and I find that with what is made by the house vault, the hens, and in all other ways, I have pretty large piles in the spring. I have seen good effects from guano and other concentrated manures when fortunate in the application of them just before a shower. I have this year one man and boy eight months, and one for the year, with additional help in haying time, and a few days at other times.

Groton, September, 1854.

Statement of Robert Murray,

FOR MISS S. GREENE.

This farm has been in the charge of the subscriber since the year 1835. For convenience' sake, therefore, the report is made in my name in behalf of Miss Greene, the proprietor.

The farm consists of one hundred and thirty acres. In 1835, the first year I was upon the place, we cut not over three small horse cartloads of very poor hay. No part of the farm was then under cultivation except, of course, that part of the land appropriated to the garden. There was no farm barn upon the place, and no necessity for any. All the hay we cut was put in one corner of the carriage house, and there was plenty of room for it. In 1836 we built a barn sixty feet square. Since that time we have added one hundred and ten feet of barn, with cellar under the whole, besides two corn barns, and other buildings, as the increased productions of the farm required. I now feel the want of still more barn room. The farm is divided as follows: About twenty acres of woodland or ornamental forest trees, eighteen acres of pasturage, and the balance tillage and mowing. I have reclaimed four small lots of meadow, amounting in the whole to about five acres. Each of the lots is small. This fact, as a large proportion of the expense consists in the draining, makes the cost of reclaiming these five acres much greater than what it would be in ordinary cases. The average expense has been two hundred and fifty dollars per acre. I was obliged to build one hundred and sixty-three rods of covered drain, with stone, fifteen inches in the clear, covered with slate stone brought from Newton, and placed so far beneath the surface as to be out of the reach of the plough. If there had been one hundred acres of meadow instead of five, the same amount of drain might have been sufficient. I took my levels in draining so as to be able to keep the water eighteen inches below the surface. In this way I can make it either tillage or grass land as I see fit. When in grass, I cut upon the average two tons to the acre. Previous to the draining, this land was entirely worthless. Since that time it has paid at least ten per cent. upon the whole amount expended upon it, and is decidedly the most productive land on the place.

All my manure is used in a compost state; the materials being barn manure, night manure, and meadow mud, all mixed together, broken up fine and thrown into heaps at least four feet high, using no more barn and night manure than will insure a good fermentation. I always throw it over at least twice—am not satisfied with the fermentation until I find the thermometer rises to ninety degrees when plunged into the heap. I then consider it fit for the land. For all crops I put upon the land at the rate of seven cords to the acre; I spread upon the surface, and either harrow or work in with the cultivator; this last is preferable.

I seed down in the fall, from the first to the twentieth of September, using three pecks of herds grass and half a bushel of red top to the acre. I use no clover. I prefer abundant seeding, giving a close surface, and leaving no space for weeds. I work in the grass seed with the spring-tooth horse hay rake, with birch branches tied on the teeth; it does the work in a better manner than the old-fashioned bush harrow.

I have sometimes used lime and plaster on the land as an experiment, but never with any good success. Guano I consider too expensive for a farm. I plough from ten to eleven and a half inches deep with the Michigan plough. I consider deep ploughing as absolutely essential to a good crop, particularly in a dry season.

I kept the last season eight cows, one yoke of oxen, two horses, and from six to ten swine. Each fall I am in the habit of purchasing fifteen heifers with calf, to keep over, to eat up the corn stover, oat straw, &c., and to make manure. These I sell again in the spring at a liberal advance. To do the work on the farm, I require and use one pair of horses and one yoke of oxen. The kind of swine I prefer is a cross of one-half native and one-half Suffolk. For cows, I have found the native and Ayrshire half bloods the best for dairy purposes.

In 1853 my wheat field consisted of about four acres, from which I received one hundred and two bushels of wheat, which I sold for one hundred seventy-eight dollars and forty-six cents, and the straw, of which there were six tons, for eighty-five dollars and sixty-five cents, making the whole amount of receipts from this single field two hundred sixty-four dollars and eleven cents. My wheat I sow about the tenth of September, two bushels to the acre. I do not approve of using manure as a top dressing. I think that, by this mode of applying manure, at least fifty per cent. of the strength is lost by evaporation.

I keep a journal of all my farming operations, under various heads. The farm is divided into nine different lots. I keep a separate account, debt and credit for each lot, charging it with the amount expended upon it day by day, by way of labor, or for manure and seed, and crediting it with the products received from it. At the close of the year the balance is struck, showing at a glance the gain or loss for the season.

In the statement below I give the result of my farming operations for the year 1853, taken from my books. The results of the present year I, of course, cannot as yet ascertain; I can guess how much corn and wheat, &c., I am going to have. But as the committee observed, I have no column in my book for guesses; and reports or statements made up upon mere conjecture are very unsatisfactory documents. The farm has suffered very much from the extreme drought.

For reasons unnecessary here to mention, the quantity of land under cultivation, in the year 1853, was very small as compared with former years; our usual average of corn planted is from eight to twelve acres. The amount of receipts and expenditures, for 1853, presents a fair average for the last five years. I had one acre of corn, five of rye, four of wheat, six of potatoes, roots, and vegetables. The present year I have had eight acres of corn, one and a half in ruta-bagas, one and a half in carrots, two in potatoes, one quarter in white pea-beans, two in vegetables, one in strawberries, raspberries, and other fruits, seven in wheat, five in rye, and a. half in green corn for cows. I give below my receipts and expenditures for the year 1853:—

Receipts:—

Hay, 58¼ tons,	$1,372 25	
Wheat, 102 bushels,	178 46	
Potatoes and vegetables,	334 00	
Corn, 60 bushels,	63 35	
Oats, 127 "	73 66	
Rye, 97 "	97 00	
Wheat and rye straw, 24¼ tons,	360 68	
Corn stalks and husks, sold,	12 85	
Ruta-bagas, 420 bushels,	168 00	
Turnips and parsnips, 69 bushels,	11 50	
Fruit,	87 87	
		$2,759 62

Expenditures:—

The amount expended in labor of men and teams, in manure and seed,	1,452 74
	$1,306 88

WALTHAM, September 27, 1854.

Statement of Lewis H. Hildreth.

The improvements on my farm, which you first visited in the fall of 1852, have been so gradual, that when you were here, I, being unwell at the time, did not call your attention to them as I could wish to have done. One of my young apple orchards, the trees of which were stunted by witchgrass in 1852, has since then made a good growth. Another, which you did not see, has grown very thriftily, with the exception of two rows on one end, the ground of which has not been kept so constantly cultivated, showing conclusively to my mind that if a man wishes to eat of the fruit from a young orchard, set out by himself, he must either set it out while very young, or keep his grounds cultivated.

Besides former ditching, I have dug another this fall, about forty-five or fifty rods long, eight feet wide, and five feet deep. This I dug for a threefold purpose: first, to obtain the meadow mud, or peat, which is convenient to my barn and very valuable; second, to drain the moist ground on either side, which, I think, it will do thoroughly; third, and not the least important, to make a receptacle for the stones lying on the surface of my land, of which I have a superabundance.

My mode of making covered ditches is to dig to a suitable depth, from three to five feet, according to the amount of stones which I wish to dispose of; these I haul to the bank of the ditch, lay cobbles in the bottom at the distance of eight inches apart, place over them flat stones, and on top of these fill in with small stones to within fifteen inches of the surface; I then level up with the dirt dug from the ditch, and either spread the remainder or cart it to my barn yard. I have found great benefit from this course. The work of the farm has been done out of doors by myself and two young boys, thirteen and ten years of age, and in doors by my wife and daughter, five years old.

I planted about five and a half acres of corn, including that for fodder, which promises a good crop. I sowed about four and a half acres of oats, all good, and one field very heavy.

My hay crop has been gradually increasing for the last nine years, and I now cut nearly or quite three times as much English hay as I did when I bought the farm. From one of my cornfields I have cut and husked the corn that grew on fifteen square rods. The product was nine and one-half bushels of sound corn, and one-half bushel that was not ripe; equal to one hundred and one bushels of ears of good corn, and a little over ten of poor, to the acre.

My fruit, taking into account my trees that have been grafted within the last seven years, will, I think, afford me more profit than they have during any previous year, unless it were the year 1852. I think that my crops as a whole have never been so good before.

WESTFORD, September, 1854.

Statement of Francis Richardson.

The farm which I offer to your notice contains fifty acres of land in all; about twelve acres in wood, and the balance nearly equally divided between upland and meadow. Forty acres of it I purchased some fifteen years ago for five thousand five hundred and four dollars. Little or no improvement had been made on the land further than to lay some rods of stone wall upon it. I purchased it in two parcels in the years 1847 and 1849, paying one thousand three hundred dollars for the same, or at the rate of thirty-two dollars and fifty cents per acre. When it came into my hands, probably not more than one ton of market hay was cut on the whole place, the rest being white weed and meadow grass of little or no value, with the usual variety of brakes and bushes to be found in old fields, with the exception of some eight acres of ordinary pasturage.

My first operation on the meadow was to dig two hundred rods of blind and open ditches in the fall of 1849, and my experiments have been confined to six acres of it. In the winter of 1849–50 I carted upon one acre thirty-six squares of gravel mixed with loam from a knoll hard by, at an expense of thirty-six dollars, spreading it three inches deep on the surface. In this condition I left it until the succeeding fall of 1850, when I top dressed with a compost, twelve loads to the acre, sowed my grass seed, and harrowed it in, the whole costing forty-five dollars. Since then I have cut about two tons of first-rate English hay on the acre each season. I continue top dressing, however, every fall.

In the fall of 1851 I turned over another acre with the bog hoe, costing twenty-eight dollars; the next two years manured with ten loads, and planted with Chenango potatoes, which paid all the expense of reclaiming the same. In August, 1853, I seeded with grass, and this season cut one and a half tons of good English hay from the acre.

An acre adjoining, but not quite so moist, covered with various kinds of worthless bushes, I ploughed at the same time when I bog-hoed the other, blasted and dug out a large quantity of rocks, planted with potatoes two years, manured as above, which paid all expenses, and seeded to grass last fall. This summer I cut one and a half tons of English hay on it.

In August, 1852, I ploughed one acre deep, turning it smooth, and the next winter carted on forty loads of sand, leaving it in heaps. The following spring, March, 1853, after levelling the sod with the hoe, spread the sand evenly; then, with a hand barrow and plank, wheeled on, as I estimated, seven cords of compost, first sowing the seed, and then spreading the manure over it. The same season I cut two crops of very heavy grass from it, and this season two tons of clover, red top, and herds grass.

In August, 1853, ploughed two acres more, putting on sand in parts, and manuring a part. This spring I planted with corn and potatoes, and the part manured did the best. I shall have a fair yield of corn. As to the potatoes, twelve hills yielded a bushel on the moistest parts. This concludes my experiments on six acres of meadow. I will add that the soil on the above varies from nine to fifteen inches in depth.

As to the remaining ten acres, I purchased them two years ago. The soil is light—a sandy loam—and has been very much neglected, and has not been considered as by any means valuable. Upon one hundred square rods of it, however, at a cost of fifty dollars for labor and manure, I have raised and harvested this season one hundred and seventy-five bushels of prime silver-skin onions, worth four shillings per bushel, making one hundred sixteen dollars and sixty-seven cents, leaving a profit of sixty-six dollars and sixty-seven cents on the lot, or at the rate of one hundred and six dollars and sixty-seven cents per acre, if I am correct in my figures.

BILLERICA, September, 1854.

WORCESTER.

Report of the Committee.

The committee on farms respectfully beg leave to report:—

Mr. Harvey Dodge, of Sutton, is the only person who has entered his farm for the Worcester County Agricultural Society's premium the present year. Two of the committee, Messrs. Reed and Brigham, visited Mr. Dodge and examined his farm in June; and Messrs. Reed and Bickford viewed the same in October. Mr. Dodge's farm lies in the north-east part of Sutton, on a slope of land descending towards the north, and contains ninety-three and one-quarter acres and thirty-seven rods. The general aspect of the soil is black mould, mixed with sand. The subsoil is comminuted sand, mixed with clay, and is retentive of water. For a more full description of his farm, and the management thereof, reference may be had to Mr. Dodge's statement, which is appended.

The claim of Mr. Dodge is for reclaiming his land by destroying bushes, ploughing, summer tilling, removing dilapidated stone walls, sinking stones, under-draining and irrigation. The principle of Mr. Dodge's husbandry may be well upon his hill soil. The expense of his labor is somewhat less than that of many of our Worcester county farmers to produce the same results, as Mr. Dodge employs mainly foreign labor, and with his sound judgment and eagle-like eye he has made his experience in farming very profitable.

There are strong doubts whether his mode of husbandry will well apply to most of the hill land in Worcester county, as the subsoils are essentially different; we believe, too, that there are many farms upon the hills where a suitable number of partition wall fences are truly necessary and useful to the farmer, so much so as to repay the expense of building. Trench out the line for the wall fence say two and a half or three feet deep, below the frost; then put in the large and quite small stone, making a strong and firm foundation for a single partition wall; in this way use as many of the surface stone as possible; then take the subsoil trenched out and grade up the whole to a smooth surface. This being well done makes a lasting wall.

Mr. Dodge's attention has been drawn mainly to the cultivation of root crops, fruit, and the grasses, in all of which he has prospered well. But little of the grain culture does he present; consequently he has made but little account of the fattening of pork, his farm being so well adapted to the grasses. From the knowledge the committee have of Mr. Dodge's farm, we think he is entitled to great merit for his untiring perseverance in noble and valuable improvements made upon it.

The committee award to Mr. Dodge the society's first premium, of twenty-five dollars, for his example upon similar soiled swells of land.

To those who have the good of the great whole at heart, it is gratifying to note the increasing interest manifested by the community in the truly noble occupation of farming, and our consequent rapid advancement in an agricultural point of view, and to observe that, while in manufactures and commerce we occupy a proud position, our agricultural interests are not forgotten or carelessly remembered. Although much has been done for the encouragement of agriculture, and notwithstanding many of our most intelligent and influential men are untiring in their exertions to elevate and render attractive the occupation of the farmer, much remains to be done; and it is to the young especially that we must look for the manifestation of that worthy ambition and honest pride, unwearied zeal and self-ennobling industry, which shall entitle our agriculturists to the foremost rank among us. It is upon the products of the soil that we depend for subsistence; and surely the tillers of the soil should not sink into insignificance. It is true that mankind are in a great measure dependent upon one another; but it is generally conceded that the yeomanry of our land may justly claim a larger share of social independence than any other class. And what employment can be more honorable?

Adam, the father of our race, was a husbandman; and history, both ancient and modern, furnishes us with a long catalogue of glorious names, among them heroes, statesmen and poets, who were also farmers. The noblest of them all, and the dearest to our hearts, was the farmer of Mount Vernon—our own WASHINGTON. Who can ask a nobler precedent?

Respectfully submitted by

JOS. A. REED, *Chairman.*

Statement of Harvey Dodge.

The farm which I offer for the Worcester County Agricultural Society's premium is located in the north-east part of Sutton, one-half mile from the Sutton station, on the Providence and Worcester Railroad, and an equal distance south from the Blackstone River as it passes at that place. Its situation is about two hundred feet higher than the bed of the river, and has a gradual descent to the north of an inch to the foot.

An accomplished surveyor and draughtsman was employed to make a survey of all my home lots by point and compass, and draw a plan of them on a map, solely for my own use and accommodation; so that by reference to this map I am able to speak with confidence, both in reference to the quantity of land each lot contains and to the distances and degrees of rise and fall. I mention this fact of survey, as I shall have occasion to refer to it frequently in this statement, as I have had in all my operations on the farm.

An accurate field survey is what no farmer should delay for a single year. It shows him at a glance how much he has in wood, in waste, in tillage, in pasture, and in mowing, and enables him the more readily to determine what he is able to plant to corn, potatoes, vegetables, as well as other grains and grasses, by the quantity of manure he may have in his barn cellar; besides, it will pay for itself each year, principal and interest, in laying out the work necessary to be done on the farm.

This farm has been in the occupancy of the family, on my mother's side, for more than a hundred years. In 1816, at the time my grandfather died, it was purchased by my father at different times, more to keep it in the family than for his own convenience; and as my father's residence was some two miles distant, he was compelled to rent the house to a tenant, and manage the land to the most profit, as was supposed, by selling off the hay and grain, or at least all that was salable, and spending only the poorer quality on the farm. This continued until the spring of 1828, twelve years, and I believe that hay and grain enough had been sold or carried from the farm to pay the original cost. I took the farm as a tenant in 1828, and then and for several years afterwards the barn was not more than half filled with all the hay that could be cut on the farm. From 1828 to 1843 I occupied this farm as a tenant. I spent all the hay and five times as much grain as could be grown on the place during these fifteen years, and still found it up-hill work to improve the condition of the land, much as I was engaged in other business.

I bought the farm in 1843, and claim to have improved it—first, by under-draining; secondly, by irrigation; thirdly, by deep ploughing; fourthly, by more thorough tillage and better manuring; and fifthly, by removing a large quantity of surface stones, and old, useless partition stone walls, mostly by sinking or filling into under-drainage; and lastly, by setting some two hundred and twenty apple, one hundred and thirty-five pear, one hundred quince, several peach, cherry, grape, gooseberry, and other small fruit trees, nearly all of which have been set within the last five years, and have mostly fruited the past season.

Your society's premium is offered "for the best managed farm, regard being had to the value and extent of its improvements and economy in its management in the last five years, a particular account of the expense of which, as far as practicable, must be given."

My farm contains by measurement ninety-three and one-quarter acres thirty-seven rods, divided as follows: ten acres of wood, ten acres of waste or not reclaimed, twenty-two acres of pasture, six acres more for corn, potatoes, and carrots, and the balance in mowing and orcharding. No other lands belonging to me do or have for the last five years contributed to the support of this farm, by the products being brought home and spent, as sometimes is the case.

The road runs nearly east and west, and divides the farm into about equal parts north and south; and my buildings are situated nearly in the center of the farm, and stand a few feet higher than the east or west terminus of the road.

In September of 1849, twenty-four acres in front of the buildings, on the south side of the road, were in eight different lots, enclosed by more than two hundred rods of heavy, dilapidated stone walls, which had been thrown up from time to time from the adjoining lots, without any other apparent object than to get rid of the small stones. About equal portions of these eight lots were mowing and pasture alternately. The twelve acres of pasture had been covered with brush and stones, and were appraised by a former committee at seventeen dollars per acre, as its only value for agricultural purposes at that time.

In September, 1849, I caused a drain to be cut thirty-three rods in length by three and one-half feet in depth and three in width, and found the subsoil so very different in all respects that my attention was called to other portions of these pastures, until I finally determined to under-drain each of them. In three years we had cut six hundred rods of this drainage, and used all the surface stones, as well as the two hundred rods of inner wall, to fill the drains. Several hundred larger stones than could be used in the drains were sunk on the spot by digging a hole by the side of them and rolling them in; then small stones were used to fill the hole within twelve inches of the top; stumps and brush were put on to keep the dirt from falling down; then the soil that was thrown out was brought back with an ox shovel, and the ditches were filled. The balance of the subsoil was used to grade up between the ditches, which were principally cut six rods asunder. In this way all was left smooth for the plough, which was successfully passed through these lands. They were left to summer-till for one year by the aid of the harrow occasionally, and after this dressed with manure and sowed to turnips and grass—one part in 1850–51; the last was seeded this year. The old mowing part of this lot was ploughed ten inches deep with a Michigan subsoil plough, the large stones sunk, and a liberal coat of manure spread on. At this time the whole twenty-four acres are in one lot, all in grass, so smooth and free from stones that it may be mowed with horse power, (if any land can,) and will produce in its present condition forty tons of hay per annum.

But some may still be inclined to ask, Why under-drain such land as this? It is no more moist than the most of our Worcester county hill-lands, which are very retentive of water. My answer is, In taking a thorough survey of these eight lots, enclosed by two hundred rods of ill-shaped old walls, running in all directions, enclosing them in unsightly forms, besides actually standing on two acres of virgin soil, and considering the waste of headlands, which on each side of these walls were the receptacles of brush and noxious weeds, using up full another acre, and the damage to and time required in turning the plough, the mowing machine, and the horse rake, I thought these walls should be removed and all brought into one lot.

The drainage water on part of the lot is brought into an open ditch by the side of the road which runs east and west, and is carried on from thirty to fifty rods, thence across the road in three culverts, twenty rods apart, and used for irrigating some sixteen acres of dryer mowing land, having a greater fall than the above described. And the good effect of this water for irrigation is apparent to all who have witnessed its application. I have no doubt that the water alone has increased the hay on the first eight acres a full half ton to the acre annually. Besides these, a main under-drain is so constructed that it takes all the surplus water not wanted for the purpose of irrigation to an old, dry pasture, after taking in its way the drainage from the buildings, causing the pasture to produce more than twice its former crop.

The land on which my apple, pear, and quince trees stand has been under-drained to some extent, and a very large number of bowlders, or stones larger than could be used in the drains, was sunk on the spot. About six acres have been prepared and set to trees, as above described, within the last five years, and many of these trees have borne the past season. This land was all ploughed or spaded to the depth of fifteen inches before the trees were set out, and has been kept in a constant state of cultivation, mostly to vegetables, such as onions, cabbages, carrots, beets, turnips and parsnips—the larger part for market, and the balance for stock. The original cost of preparing these six acres and setting the trees was about one thousand dollars. Manure has been liberally used on these grounds, and remunerating crops have been produced in return, all of which have been charged and credited to the land, without reference to the growth of between four and five hundred of these fruit trees, now nearly in a bearing state, which promise to pay well for the care, patient labor and cost bestowed upon them for the last five years. No pains were spared in the selection of these trees, either in quality of fruit or character of the tree. They were set in the spring, and in no instance until the land was in a suitable state for planting. Holes were made two feet and a half deep and four in diameter, and filled with rich surface soil, mixed with chips, dung, or rotton wood, and about fifty pounds of waste bone to each tree, evenly distributed beneath the roots. Care was taken to set the tree no higher or lower in the ground than it was in the nursery. All the pruning has been done from the first of June to the first of August, and when the limb or twig was so small that it would mostly heal over the first year. Gum shellac, dissolved in alcohol, has been used to cover the fresh wound as soon as the limb was taken off.

I will mention one fact in connection with my apple trees. I do not wash my trees with any kind of akalies or any thing else, believing as I do that it will be the death of the tree. Deep and thorough cultivation of the land on which they stand insures a healthy and vigorous trunk, branch and root. The roots of my trees have been trained to find their subsistence far below the surface—the surface roots having been cut off to the depth of at least six inches. In this way they have not suffered by drought, and it keeps them back until later in the spring. My pear trees have all been set in the same way, except six inches deeper in the ground, putting the graft or splice six inches below the surface, and always using a richer compost than for any other fruit. Trees on quince stocks I set ten feet apart, and standards fifteen; apple trees thirty-three feet apart.

Within five years past I have dug a cellar of ninety feet in length under my stables, and built a cellar of stone and mortar large enough to hold fifteen hundred bushels of roots. The cellar under where my cattle and horses stand holds all the liquids and solids dropped during about eight months of the year. The bottom of the cellar is clay, and holds all the liquids that are not absorbed. About two feet of loam are placed on the bottom of the cellar, as soon as the manure is carted out, in September of each year. My open barn yard rests on a clay bottom, and is so constructed, by being lowest in the centre, that all the washings, by rain or otherwise, concentrate there. Subsoil from my most clayed under-drainage is carted into this yard each fall, and permitted to remain until the following spring, where it receives the droppings of the cattle, and mixes with the waste corn buts and straw from the mangers. The yard is ploughed the last of May or first of June, and fifteen or twenty ox cartloads of manure taken from the barn cellar and laid in the centre of the yard lengthwise; an ox shovel is then used to bring the outskirts of manure into a row in the centre of the yard; common salt is dissolved in water at the rate of a peck to the ox load, and thrown on to the heap until it is completely saturated; it leaches out into the trenches by the side of the manure heap and is thrown back on to the heap every few days, thus keeping the whole mass wet until within a few days of the time it is wanted for dressing grass or other crops. It is thrown over and permitted to dry before carting out.

I should have stated that loam or subsoil was spread over the yard, immediately after the above heap was scraped up, to absorb the urine, while all the solids dropped by yarding the cows for the four summer months were gathered up each morning and thrown on to the main heap of compost. About one hundred and fifty loads are made in this way, and used principally for dressing my natural mowing, either as a top dressing, or where the old field has required re-seeding and ploughing. That taken from the barn cellar, as well as from the pigsty, is used for corn, potatoes, and other vegetables; about one hundred and fifty loads are annually made in these two departments. Other compost heaps are annually made with loam and spent lye from the soap shop. Leached wood ashes from this shop have been used for the past three years at the rate of about fifteen hundred bushels annually, which are spread broadcast, but never with animal manure of any kind, lest the ashes should cause the manure to part with its ammonia, either in the compost heap or open field, more rapidly than is required to feed the plant.

The manure from a stable, where six horses have been kept, has been added to my compost heap at a cost of about thirty-six dollars annually.

I have used for my different crops, though mostly for cabbages, about two hundred bushels of common unleached wood ashes per annum for the last three years with very signal success. But few of the phosphates have been used on my farm. A few hundred pounds of the super-phosphate of lime were used on corn last year; and up to the first of August the effect was very apparent, but at harvest it was quite impossible to distinguish any difference in the crop. This season guano, after being mixed with five times its bulk of fine mould, was used in the hill at the rate of five hundred pounds to the acre; but for some cause the corn did not come up, and planting over again brought it so late in the season that the experiment was any thing but satisfactory. This experiment was on corn planted on an old worn-out pasture where no other manure was used. I put the guano on the one part, and wood ashes, at the rate of fifty bushels per acre, was put in the hill on the other part, with very satisfactory results on corn and potatoes.

About one hundred rods of bank wall on the road side have been set within five years at a cost of about two dollars per rod; no inner walls have been built or reset. I believe that most of our Worcester county farmers have built ten rods where they really wanted one. This has been continued from year to year, and the whole farm divided and subdivided until the walls cannot be reset for what the farm would sell for. But Mr. A. asks what he shall do with the surface stones on his fields; Mr. B. thinks his cattle do best by change of pasture; and Mr. C. does not know how he shall get the after feed in his mowing field when a part is planted to corn.

I would state in reply to Mr. A., that in nine cases out of ten the large stones on land can be sunk much cheaper than they can be got out and drawn to where they would be wanted for building wall; and after the stones were drawn, the expense of building a substantial wall would be about equal to the whole expense of simply digging by the side of the rock a hole twice as large, tipping it in and covering it with the earth dug out, taking care that the subsoil be on the top, and the turf bottom side up next to the stones. In this way the land is raised above the stones; while on the other hand, if large stones are dug out and carried off, the soil is lowered, and other stones are soon exposed on the surface.

Many acres in our county of what is termed natural mowing, or such as has never been ploughed, may be treated in this way, and the surplus dirt used to fill up the cradle holes and make all smooth for the mowing machine; at the same time these cavities act as under-drainers to a considerable extent. No material equal to this subsoil can be used for the improvement of the surface soil. I have used the subsoil as an absorbent in all my yards, and in my barn cellars, for the last five years, not from necessity, but from choice. The value of the subsoil may be tested in the pig pen, sink drain, cow yard, or stable. It shows itself possessed of five times the power of taking the ammonia that surface soil has. A common flower pot may be filled with surface soil from the cultivated field or garden, and the black, turbid water from the barn yard filtered through it, and it will lose but little of its color and smell; while the same experiment with subsoil which has not been cultivated will extract nearly all the color and odor out of the water—showing that the subsoil will gather and retain ammonia from both air and earth; but the surface soil has lost this power of retaining the ammonia. Hence the advantage of ploughing ten inches deep on most of our worn-out hill lands. The subsoil can rest, and gain strength and vigor, and the roots of grass or grain are invited to a greater depth.

I have several acres of what we call natural mowing, land that has never been ploughed, and it is some of the most profitable and productive on the farm. Nothing has ever been done to it except to put on a light top dressing once in four or five years. These lands were very uneven and stony, and it was quite impossible to use the horse rake. Still they gave us large annual returns, with but small outlay. But the horse rake has for the last dozen years been speaking in language not to be misunderstood. And now the mowing machines have been brought into use, and will cut our grass at the right time, and in the best manner, if we prepare a tolerably smooth surface for them to work over. Several acres of this land have been prepared in the manner above described, and now produce two tons of good hay to the acre. Such lands were never designed for the plough; and in sinking the stones, we only wish to put them just below the surface. Some are only pounded off with sledge hammers, and the surplus of subsoil is used to grade up. One peck of herds grass and twice as much red top are then sown, and two cartloads of compost spread, and all smoothed over with the bush harrow. Such lands as these have suffered much by the mismanagement of inexperienced or unskilful cultivators. This moist, stony ground has in many cases been broken into with the plough, all the surface stones taken out and made into costly division walls, when, in fact, Nature had designed them for natural mowing. In England the landlord, in his leasing of land, takes the precaution to prohibit his tenant from ploughing certain lands, and they will be good for generations to come.

All my fields designed for cultivation or for a rotation of crops have been ploughed with a Michigan plough, to the depth of from eight to twelve inches, for the last three years. This can only be done with a strong team. In breaking up the substratum of these clayed soils to the depth of ten inches, where they have never been disturbed more than half that depth before, it requires three times the strength of team that is needed in shallow ploughing. The cost of ploughing in this way is about six dollars per acre, while ploughing five or six inches deep costs but three; but for all coming time the substratum is broken, and the soils thoroughly mixed, without the aid of a heavy iron tooth harrow. Five acres of my mowing land, which had been grown to grass for from ten to twelve years, have been most successfully ploughed with the Michigan plough to the depth of ten inches. A light bush harrow was passed through it lengthwise. Thirty ox cartloads, of thirty bushels each to the acre, of the above described salted compost were spread on, grass seed sown, the bush harrow used to cover the seed and smooth down the land, and nothing more will be required but to run over a heavy roller in April or May. Two acres of this land were treated to a pound of improved turnip seed to the acre at the same time the grass seed was sown. The turnip seed sprang up rapidly, and now promises to pay for manure, ploughing, and re-seeding. The young grass looks promising for a crop next year.

Four heavy-working oxen and three horses have been kept for doing the work on the farm; though about one-half the horse power has been used for carting ashes and soap for a small soap establishment belonging to the farm and rented out, and the waste ashes are taken for rent and horse hire. Milk is sold, calves fattened or raised, to the amount of about three hundred dollars a year. Young cattle, mostly of the North Devon breed, have been bred to some extent, and sold for breeding purposes. Cattle have, to some extent, been bought in the fall to consume my surplus vegetables, such as would not sell readily for table use, and others have been sold for beef during winter. One man has been constantly employed on the farm for the last five years. I hire him by the year, and last year paid him one dollar per day, he finding his board and lodging. Two other hands are employed for seven months in the year, costing from five shillings to a dollar per day, in most cases boarding themselves. My mowing the past season was let out to be cut by the acre. The price paid was seventy-five cents per acre, and it was done to my entire satisfaction. The mowers found themselves.

Cheap tenements are furnished for the laborers on the farm, convenient to the buildings occupied by myself, and no farm laborer has boarded in my family except a chore boy who has been with me several years. Formerly we furnished board and lodging for the farm help; but, all things considered, we find it more comfortable, if not as profitable, to furnish cheap tenements conveniently located, and let the men board themselves.

I will give the expenses and income of my farm the present year; and as your rules require me to make this return on or before the first of November, I shall be obliged to estimate some of the late crops that have not yet been harvested; although in these cases, such as carrots, turnips, and cabbages, a square rod has been measured, and pretty correct estimates thus made, and included in the account below.

Farm account, Dr., 1854:—

To interest on its present value,		$400 00
Blacksmith's bill,		25 00
Leached ashes and other fertilizers,		125 00
Lumber and carpenter's work in repairing buildings and wear and tear of tools, and interest on the same,		75 00
One man's wages for twelve months,	$312	
Board and wages of chore boy,	150	
Other labor by the job, day, week, and month,	212	
	——	674 00

The farm is credited, October, 1854:—

By 900	bushels of onions, 400 of which were sold on the lot for 75 cents, the balance were stored for winter sales,	$675 00
100	bushels of beets, at 37 cents,	37 00
3,700	cabbages, at 4 cents,	148 00
150	bushels of French turnips,	50 00
500	bushels of carrots, (three-fourths of an acre,) at 25 cents,	125 00
50	bushels of parsnips, at 25 cents,	12 50
500	(estimated) bushels of flat turnips, at 17 cents,	83 00
50	bushels of early potatoes,	50 00
	Saffron,	10 00
20	barrels of winter apples, 15 bushels of quinces, and 12 bushels of peaches,	37 00
140	barrels of late potatoes, at 50 cents, ,	70 00
	Early apples, at $10,	10 00
25	tons of hay for market, at $15,	375 00
35	(estimated) tons of hay, same quality, worth for home feeding, $8,	135 00
15	bushels of rye,	15 00

40 bushels of barley, ...	$30 00
Corn and corn fodder, ...	50 00
Milk sold and calves fattened while the cows were at pasture, from June 1 to Nov. 1,	190 00

I have gone more into detail in my present statement than I at first designed, more especially in relation to my orcharding, under-drainage, sinking of stones, and described the materials which are used for my compost heap, and still I feel that I have not done justice to either.

Under-drainage and irrigation, or the free use of the subsoils for the compost heap in preference to the surface soils, are, to a very great extent, practices almost entirely new in our county. I think your committee will bear me testimony when I say that this deepening of my soil promises to do all that I have claimed for it. My crops of hay as well as vegetables have been increased within the last five years full fifty per cent., and have been trebled within the last ten years; while the cost of producing, by way of labor, is not so much as for smaller crops. Hay can now be made for one-half the cost per ton before the fields were cleared of stone. A crop of sixty bushels of corn to the acre requires no more hand labor now than twenty-five bushels did formerly. Seven hundred bushels of carrots per acre are quite as easily produced as three hundred. The only difference is in harvesting; and this is all overcome by the use of better machinery, which can only be worked on land comparatively free from stones. The horse rake, the horse hoe, the mowing machine, the onion hoe, all of which are at this time too well known among the farmers of Worcester county to need any mention from me, were all unknown a dozen years ago. These dumb machines have done more by way of suggestion in cleaning our fields of rocks than all other arguments put together. Who has ever used the horse rake on stony ground and did not resolve to take them out before his hay harvest came round again?

So with orcharding; the farmer cannot afford to buy trees of second quality, and give them no other attention than to place them in a shallow soil, and depend on a few bushels of compost placed only close to the foot, or washing the trunk occasionally. Such culture will not produce fruit fit for home, or profitable for a foreign market. To produce profitable fruit on our soils the land must be well located; a gradual descent to the north, east, or west is to be preferred; good judgment is required in preparing the land and selecting the kinds of fruit that are most profitable. In ploughing my onion ground the past week, my attention was called by the ploughman to the fact of the ground being filled with apple roots and fibres, although he was then in the centre of two rows, full sixteen feet from either tree. These trees had been set but seven years, and it would be fair to suppose that they take their nourishment now from all parts of the field. If so, why put the compost near the but only, as recommended by some? This field has grown onions two years; and the land not having been ploughed deep last year, the weeds had taken the liberty to come nearer the surface than I wish them to grow.

The committee will see that I have made no account of beef, pork, and poultry, and this is produced, as well as milk, during the winter, from the grain, &c., which has been spoken of. Neither has mention been made of labor to the amount of about a hundred dollars, which has been expended for permanent improvements. Two thousand barrels of vinegar have been put in the market, and as much more cider for the same use has been manufactured the present fall. On the other hand, my personal services have not been reckoned into the amount.

I will mention, as I should have done before, that I have been growing about the same crops, onions excepted, for from three to five years, with an increased amount each year.

SUTTON, November 1, 1854.

WORCESTER WEST.

From the Report of the Committee.

The encouragement of agriculture we believe to be the first subject that should engage the attention of our agricultural association. There lies the foundation of all our improvement, and there we see and feel the greatest and best influence.

The most humble farmer feels its benefit in the observation and communication of such facts to the public as relate to improvements, to experiments, and their results. One farmer is prompted by the example and success of another; and so on through a town more interest is manifested, as is evident from general appearances, and the old superstitious notions of following in the footprints of their ancestors are thrown off.

The committee have been called to visit but one farm during the past year, and that of the second grade for which the society offer premiums, owned by J. Addison Merriam, of Barre. We would gladly refer the whole subject matter of this case to the statement of Mr. Merriam which accompanies this report, if in so doing we could feel our duty fully discharged. But something further seems to be required. The committee, on visiting this farm, had their attention directed to the improvements upon a few acres which appeared to be such as to do great credit to the owner, and will go down to posterity as a reward for his labors.

There was a doubt in the minds of the committee whether or not it was good policy for a farmer to cultivate and improve a few acres of his farm at the expense and neglect of the many. Their conclusion was that it was an error that we see too often, but hope the time is not distant when we shall see a change in this respect. The man who improves his whole farm is the one who ranks with the first class of farmers. We should be glad to see more attention given by every farmer to those expedients that dignify and adorn agriculture, so that it should appear to the passer by, when he looks upon the neat combination of shades and flowers, that a man lives there who is something above a mere drudge and sloven—one, indeed, who has taste and a cultivated mind.

A description of the farm to which the committee award the premium of eight dollars, together with a statement of its products, is given by Mr. Merriam, and is herewith submitted.

JOSIAH WHITE, *Chairman.*

PETERSHAM, November 15, 1854.

Statement of J. A. Merriam.

My farm which is entered for the society's premium contains sixty acres and thirty-eight rods, in two separate lots. The home lot contains forty-three acres and one hundred and twenty-seven rods, and is divided into nine acres and sixty rods of woodland, twenty-one acres and five rods of pasture, nine acres and thirty-six rods of mowing, and four acres and twenty-eight rods of ploughing, and one lot containing sixteen acres and seventy-one rods, of which about four acres are an alder swamp and birch knoll, and all used for pasturing.

The valuation of the assessors is:—

Farm,	$1,680 00
One horse,	25 00
Two oxen,	120 00
Eight cows,	230 00
One yearling,	8 00
One hog,	12 00

Interest on farm and stock,	$124 50	
Taxes,	14 70	
Blacksmith's bill,	8 00	
Amount paid for labor,	51 86	
Value of labor done on the farm,	150 00	
Labor in the house,	100 00	
		449 06

The produce of the farm is:—

18 tons of hay, at $15,	$270 00
1 acre 130 rods of oats, 80½ bushels, at 55 cents,	44 27
1 acre 34 rods of corn, 58½ bushels, allowing 80 pounds for a bushel, at $1.10,	64 35
128 bushels of potatoes, at 42 cents,	53 76
2 tons straw,	10 00
Corn stover,	10 00
4 cartloads pumpkins,	6 00
733 pounds of husks, sold for mattresses, at 2 cents,	14 66

25 barrels of apples,	$25 27	
Cash for fruit at sundry times,	4 86	
9½ barrels of cider,	9 50	
500 pounds of pork, at 8 cents,	40 00	
1,455 pounds of cheese, at 11 cents,	160 05	
178 pounds of cheese, at 7 cents,	12 46	
100 pounds of butter, at 22 cents,	220 00	
87 dozens of eggs,	16 16	
3 veal calves,	30 50	
Value of produce consumed by four persons in the family, at 75 cts. per week,	156 00	
		$1147 84
Deduct expenses,		449 06
		$698 78

I came upon my farm in the spring of 1842, and have spent a good deal for seven years past in improving the land by blasting and removing large rocks, carrying off small stones from the fields, filling stone holes and hollows, levelling for mowing, and have finished about six acres in this manner. I have built two hundred and thirty rods of wall, estimated to cost from seventy-five cents to five dollars a rod, and new topped forty rods. I have grafted forty-seven apple trees, (a part of them bearing,) four pear trees, and have a good supply of other fruit. I bed my cattle in the stable with straw and refuse hay, and throw it with the manure out of the window, and use it for surface-spreading on the mowing and tillage land in the spring. In the summer I make about forty cartloads in the barn yard, using loam and swamp mud, and cart loam into the hog yard. I usually remove from it twenty-five or thirty loads in the fall to the mowing ground, and spread it in the spring. That removed from the barn yard in the fall is used to put in the hills of corn and potatoes. For the last three years I have not built so much wall as I did in the four preceding years, having built about thirty rods of wall, ten rods of it estimated to cost five dollars a rod after the stones were blasted and drawn from beds. I have removed the stones and filled up the holes on about two acres, and have grafted about twenty apple trees. The water for the barn and soft water for the house are brought in lead pipes from a well in the orchard twelve feet deep, which usually failed in a dry time, but has been made to supply us well by digging trenches from the bottom of the well, five rods long, into the hill, and fifteen feet deep at the upper end, stoning up a small channel, and then filling with small stones, and completing by filling with the earth dug from it. I usually pasture from six to eight cows and one horse. My oxen and other stock are kept on hire. This year I milk six cows, one of them three years old, and am raising three calves. The season has been unfavorable for hay and grain, the ground being so wet in the spring it could not be ploughed in good season. One lot was sown towards the last of May, the other about the 10th of June. My corn was planted the 1st and 2d of June, and the wire worms destroyed about fifty rods before it came up, which were planted afterwards with potatoes. Later in the season the hay and grain were injured by dry weather.

Barre, October 31, 1854.

HAMPSHIRE.

Report of the Committee.

The committee report that entries for premiums have been made by Austin Smith & Sons, of Sunderland, and by Theophilus P. Huntington, William P. Dickinson, and Royal W. Smith, of Hadley.

The committee visited the farms of these gentlemen as directed by the rules of the society; and we take pleasure in saying here, that the hospitality with which we have been received has been such as to induce the hearty wish that we had as many premiums to award as there have been entries made, so that none of our friends need go unrewarded.

We find, however, that there are but two premiums—one of twenty, and the other of ten, dollars. The first of these we have awarded to Austin Smith & Sons, of Sunderland, and we are confident that a discerning public will find reasons for our so doing in the accompanying statement of these gentlemen.

So far we found plain sailing, and if that course had brought us into harbor we should have been glad; but there were competitors from Hadley, all of whom exhibited good farming, and so equally good that it was difficult to discriminate in favor of either against the others. In the farm management of Mr. Huntington and in that of Wm. P. Dickinson we saw much to commend. These men have exhibited the right spirit, and, so far as we can judge, the right practice, with regard to the reclaiming of waste lands. Our region of country would soon be more beautiful and more productive, and, though now healthy, would be still more conducive to health and long life, if all owners of lands would farm them as well. Both in the reclaiming of swamp land and in the cropping of their lands generally they have done well. Their practice proves farming to be a paying business—more profitable than any other business equally safe. Between them as compared with each other, and when both were brought into competition with Mr. R. W. Smith, the question was one which it seemed almost impossible to decide. Your committee, however, believed that Mr. Smith's farm management was quite as good as theirs, and his statement was somewhat full, conforming more nearly than theirs with the conditions on which these premiums were offered; which two considerations, taken together, induced them to award the second premium to Royal W. Smith, of Hadley, unless Mr. Huntington, whose farming we much approve, but whose statement was very deficient, will consent to make out a new and more full statement, one that shall be satisfactory to the executive committee; in which case we award the second premium to him.

We do not understand that the rules of the society require *long* statements. It is, however, to be supposed that the man who takes your premiums for good farm management is a good farmer; that his example is worth considering, at least, if not worthy in all respects of imitation; and if so, then it is incumbent on the competitor to make such a statement as would enable other farmers to comprehend his proceedings, and to imitate them if they choose. We specially commend that part of Mr. R. W. Smith's statement which relates to the composting of manure for his corn.

J. A. Nash, *Chairman.*

Amherst, 1854.

Statement of Austin Smith & Sons.

The farm which we have entered for premium consists of sixty-four acres, situated in Sunderland—twenty-six acres being contained in the homestead, and thirty-eight acres in the two meadows in town.

The greater proportion of the soil is a sandy loam, the remainder a clayey loam.

Fences are dispensed with, except on twenty acres of the homestead, the remainder being employed in cultivating, in rotation, the various crops raised upon the farm.

During the present year our farm has been cultivated as follows: Twenty-four acres in grass; fifteen in broom corn; thirteen in Indian corn; three in wheat; four in rye; two and one-half in oats; and one-half acre in potatoes.

It has been our aim to labor for the improvement of the farm rather than the largest possible present crop. This we endeavor to do by thorough cultivation and a continual effort to increase the amount of manure made on the premises. We have made and applied the present season five hundred and fifty loads of barn-yard and compost manure of thirty bushels each, and have, besides, purchased and applied two hundred bushels of ashes, seven hundred pounds of guano, ten bags of super-phosphate of lime, and one ton of gypsum—from each of which we have observed very satisfactory results, with the exception of the guano. The ashes and super-phosphate of lime were principally put in the hill at time of planting—the ashes for corn, the lime for broom corn.

Our barn-yard and compost manures we apply at planting time, harrowing in that which is well rotted, and ploughing in the coarse. The manure from the horse stables is thrown into the hog yard, and, with a frequent addition of muck or loam, a large quantity of excellent manure is made. Our winter-made manure is applied almost wholly in the spring, our practice in this respect having undergone an entire change within a few years.

We seed down to grass by four methods, according to circumstances: By hoeing in seed at the last hoeing of Indian corn; by sowing at the time of sowing oats in the spring; by harrowing in where rye was sown the autumn previous; and by turning over the turf on wet land in August, and harrowing in a liberal coat of compost manure.

Our team work is done principally with horses, some pieces of our land being from one to two miles from home.

We have fattened twenty swine during the past year, making forty-five hundred weight of pork, feeding upon milk and slops from the house, pumpkins, refuse apples, soft corn, &c., and fattening upon meal ground from a mixture of three parts of broom seed and two of corn.

The crops raised on our farm are consumed entirely at home, except the broom-corn brush.

The amount of the products of the farm for the present year is derived, considerably, from estimates made by a comparison with the known produce of previous years.

The price of produce we have endeavored to fix at what it would realize if sold on the farm. The broom brush having been sold, is reckoned at what it brought.

We have included in the item for labor the estimated value of our own and the expense of hired labor, with the addition of board. We have considered that nothing is lost in employing so much help as to have farm work thoroughly done and the various crops cultivated and gathered at the proper season.

Products of the farm:—

715	bushels of corn, at $1, . . .	$715 00
12,000	pounds of broom-corn brush, at 9 cents, ...	1,080 00
1,050	bushels of broom-corn seed, at 40 cents, ...	420 00
37	bushels of wheat, at $2.25, . .	83 25
90	" rye, at $1.17, . .	105 30
95	" rye and oats, at 75 cts.,	71 25
80	" potatoes, at 50 cents,	40 00
40	tons of hay, at $12, . . .	480 00
30	" corn stover, at $6, . .	180 00
3½	" wheat and oat straw, at $6,	21 00
3	" rye straw, at $5, . .	15 00

50	bushels of apples, at 50 cents,	$25 00	
30	" " at 17 cents,	5 10	
200	dozens of eggs, at 17 cents,	34 00	
20	loads of pumpkins, at $1,	20 00	
550	" manure, at $1,	550 00	
	Improvement of farm,	100 00	
			$3,944 90

Expenses:—

Our own and hired labor,	$869 00	
Grass seed,	1 00	
Seed corn, rye, wheat, &c.,	10 00	
Ashes, 200 bushels, at 20 cents,	40 00	
One ton of gypsum,	11 00	
Super-phosphate of lime,	45 00	
Guano,	20 00	
Manure, 550 loads,	550 00	
Interest on land, at $100 per acre,	384 00	
Taxes on the same,	25 60	
		1,955 60
Net profit on 62 acres,		$1,989 30
" on 1 acre,		31 90

SUNDERLAND, October 9, 1854.

Statement of T. P. Huntington.

My farm, lying on the Connecticut River, in Hadley, contains forty-four acres, exclusive of a small wood lot on Mount Warner, nearly two miles distant. My homestead contains ten acres of the first quality naturally; but this land gives much better returns with manure than without. Sixteen acres, farther back, are well adapted to grass; but the greater part is rather low for corn. Of the remaining eighteen acres, ten are occasionally tilled for rye,—though made no account of in this statement,—and eight have been left for a few years to Nature, in part, being covered with a beautiful growth of valuable trees.

In considering the improvement upon the farm, as required of competitors in the Hampshire Society's list of premiums, I trust I shall be excused if, instead of including five years, I commence still farther back, say fifteen years, when the buildings were all new, the ground comparatively bare of trees, and a considerable debt was incurred.

My main object at that time was to clear off the debt. The shortest way to effect this was adopted—viz., selling the produce, hay and grain, keeping as little stock as possible, and giving my labor to others, either in the way of days' works, or by taking land to till on shares, so that I could raise corn for market without furnishing manure.

The matter of the debt being disposed of in the course of eight or ten years, some improvement being made at the same time about the buildings in the way of painting, fencing, and setting fruit and ornamental trees, a little land added, the farm stocked, and farming implements purchased, I began to turn my attention to the improvement of the farm, my object being not so much to make the land rich as to get the surface smooth and into a fit state for comfortable culture. The result, except with the sandy land, is entirely satisfactory to myself; and I presume to flatter myself that your committee would acknowledge no small improvement had they seen the ground eight years ago. Others are ready to testify to the facts, though I say it not boastingly.

In commencing this general improvement, my plan was to take a portion yearly of the ten acres of sandy land and a portion of the sixteen acres of low ground, and so to manage, by draining, ploughing, manuring and seeding, as not only to make it pay in the way of crops, but to improve the value and appearance of the whole in a series of years.

Upon the sandy hill I prepared large heaps of muck from the low ground, mixed with manure, sometimes ploughing in this compost, sometimes harrowing it in without any perceptible difference in the result, sometimes planting Indian corn, sometimes broom corn, and some years white beans, each followed with rye and clover seed. For want of sufficient manure made upon the farm to carry out the experiment faithfully, I have been obliged to rob other fields of their portion of manure, or purchase it a mile distant. The crops, I think, have not paid for the labor and manure; the clover, if perchance it germinates, rarely survives the first summer's sun, and then gives place to a luxuriant growth of sorrel, and the soil is as poor as when I commenced. Thus I consider my experiment with the sandy hill a failure, so far as the permanent improvement of the soil is concerned; and I must look to others for instruction in the matter, for with me it has been, in more than one sense of the word, an up-hill business.

In the use of the low ground, as I have said, the result has been satisfactory. I have made it a point to have the land, before ploughing, thoroughly drained, making deep drains to cut off the springs, and covering them when the quantity of water was not too great to be carried off readily. These covered drains are made by laying two large rails at the bottom of the ditch, one on each side, far enough apart to allow a water-course between them, and and a third in the middle, resting upon the two and keeping them apart. Another may be laid on each side, and the whole covered first with a little straw; then sods inverted, and the upper part filled with finer earth. In this way I have made within a few years about seventy-five rods, which do well. After these, deep main drains were properly made, all unnecessary ditches were filled, and then the land was ready for the plough. I ploughed, for corn, turf land, in autumn, about seven inches deep, and prepared at the same time, if possible, a pile of compost manure of thirty-one horse-cart loads for each acre, to be applied in the spring and harrowed in. The ground being planted with corn and kept even, I have succeeded in getting good grass by sowing seed among the corn and working it in in August. Sometimes I give the land a second ploughing and seed down with oats.

In this way I have been over the sixteen acres, draining, planting, and seeding. The last piece of rough, low, unproductive ground has been made smooth, and I trust will prove to be productive by a different process, a plan recommended by Mr. Buckminster, of the Massachusetts Ploughman—that of seeding immediately upon the inverted sod, which cannot be too highly recommended for low ground. As your committee saw this ground before and after the operation, it is needless for me to enlarge upon it.

While I have been engaged in carrying out these principal objects, I have been constantly experimenting on a small scale for my own benefit; but, if it will be proper here and of any use to others, I will mention some, which, although they may not have been made with that exactness which might be desirable, yet are satisfactory to me. Some of the experiments have already been mentioned, and I may add that my experiment in subsoiling—though cattle-show orators may keep telling us to plough deep, that we have strata of farms (no one knows how many) underneath those we now till—has not been the most flattering. I have no doubt that subsoiling upland, the present year, would have operated well; but, in ordinary seasons, low lands deeply ploughed retain too much moisture, which retards the ripening of the crop.

Ploughing in buckwheat or Indian corn to enrich sandy land I am satisfied is a long process. Salt to kill worms, and oyster-shell lime to cut up moss and make corn grow, may answer in some locations; but something else, or perhaps nothing, is better. Guano harrowed in for corn has been dear manure to me. Many think there is economy in boiling sour apples for hogs; but sour meal and milk make sweet pork fast enough.

I have been in the habit of keeping a good supply of earth during the summer months in the bottom of the barn yard, stable, hog pen, privy, and sink hole, to absorb the valuable liquid and to be harrowed in with the manure for corn. The winter-made manure is ploughed in on corn-stalk or stubble land. I never mean to allow the air to become impure about the buildings from the waste of fertilizing matter, but have earth at hand to cover every foul spot—thus having the comfort of a wholesome atmosphere, and at the same time saving food for crops.

I have raised very little stock during the last five years, though I have now five very promising yearlings of my own raising—the main objection to raising stock in my vicinity being the want of good pastures. The produce of the farm, besides supporting the family, is principally fed to cows and hogs. The amount of butter made last year was seven hundred and twenty-five pounds, one yoke of oxen fattened, and twenty-four hundred pounds of pork. I usually employ a boy seven months in the year, besides myself, or a man half that time.

As to farming implements, I mean to keep along with the times as near as the circumstances of a small farm will seem to authorize. Going a little farther in this matter within the last ten years, I succeeded at last in getting three acres of grass cut at the very moderate sum of fifteen dollars—five dollars per acre.

I am not aware of much improvement in the way of rail fences, unless it is in laying them up in snug piles or upon the barn beams for scaffolding.

One framed building has been added to the place within the last five years, and paint and paper to the amount of some eighty dollars. The paint upon the house being yet good, it received last week a covering of oil, merely to preserve the paint, and thus the timber. This is mentioned only as an item in the "economy of farm management," as the expense did not exceed five dollars, whereas a coat of paint two years hence would probably have cost thirty.

Some sixty or more young fruit trees about the buildings, of different kinds, merely for family use, constitute the orchard, except fifteen or twenty older ones scattered upon the farm.

The income of the farm, or the produce of the present year, at the market prices, with the expenses, will stand, I suppose, nearly as follows:—

Products:—

Hay, estimated at 18 tons, at $12.50 per ton,	$225 00
330 bushels of ears of Indian corn, at 50 cts.,	165 00
4 tons of corn stover, at $5 per ton, . .	20 00
1,200 pounds of husks, at 75 cents per cwt.,	9 00
Broom brush from 3 acres, estimated at 1 ton, at 10 cents, ...	200 00
150 bushels of broom seed from 3 acres, at 2 shillings, ...	50 00
3 acres of oats, estimated at 100 bushels, at 60 cents, ...	60 00
Oat straw from three acres, estimated at 2 tons, at $5, ...	10 00
40 bushels of good Carter potatoes, at 75 cts,	30 00
20 " small " " at 25 cents,	5 00

7 bushels of early potatoes, at $1, . .	$7 00	
8 bushels of peachblow potatoes, at 50 cents,	4 00	
15 bushels of buckwheat, at $1, . .	15 00	
Green peas, sold 10 bushels, . . .	10 00	
5 bushels of wheat, at $2, . . .	10 00	
30 bushels of turnips, at 2 shillings, . .	10 00	
Rowen, pasturage, and fall feed, estimated at	25 00	
10 barrels of picked apples, at $1, . .	10 00	
12 barrels of windfalls, at 60 cents, . .	7 20	
20 bushels of cider apples, at 10 cents, .	2 00	
		$874 20

Expenses:—

Manure, including guano, $93, say one-half spent this year, ...	$46 50	
Labor by self, 8 months, at $30, . .	240 00	
Labor by son, 12 years of age, 6 months, at $10, ...	60 00	
Use of horse, wagons, and tools, . .	53 50	
		400 00
Profit, including interest and taxes, . .		$474 20

Hadley, October 31, 1854.

Statement of R. Wales Smith.

The farm which I enter for premium is in Hadley, and contains eighty-five acres. It is divided as follows: Thirty-nine acres of pasture, twenty acres of mowing, ten acres of tillage, and sixteen acres of woodland. I have, within five years last past, reclaimed twenty acres which were formerly overrun with bushes and stumps, which cost me at the outset ten dollars an acre. This lot is now under a high state of cultivation, and is worth fifty dollars per acre. This improvement was accomplished without any outlay of money, and principally by my own labor. I have practised deep ploughing, usually from seven to ten inches. Ten acres of the soil is a yellow loam, underlaid with hard gravel, and the remainder is a clay soil.

During nine or ten years past I have composted manure, and find it equal to yard manure, and better for corn. I usually make fifty loads of compost. I draw twenty-five loads of muck to my cornfield in the fall. About the first of April following I draw out to this muck heap twenty loads of barn-yard manure. I add five hundred pounds of plaster and fifty bushels of oyster-shell lime. As soon as the frost is out of the ground I mix these ingredients. When the compost heap begins to warm I pitch it over, to prevent burning. The manure will be well rotted and fermented and fit for use by the time it is wanted for planting. I have never failed of a good corn crop with this manure. I compost all my manure, and usually make from two hundred and fifty to three hundred and fifty loads annually.

I till about fifty acres in nine years, breaking up five acres of sward land each year. My system of rotation is, first, a corn crop, then oats, and lastly grass. I raise enough potatoes for my own use, and very little rye.

My farm is usually stocked with twenty head of cattle in the winter, of which about one-third are fattened and sold in the spring.

My hay and grain are fed out to cattle on the place; but my dairy products, annually sold in market, average not less than five hundred pounds of cheese and two hundred and fifty pounds of butter.

During the present year I have cultivated six acres in corn and potatoes, and four acres in oats, and mowed twenty acres. The labor has been wholly performed by myself, except for sixteen days in the hay season, when I hired a man to assist me.

Products:—

30 tons of hay, at $12.50, ...	$375 00
5 acres of grass, sold at $11.50, . .	57 50
250 bushels of corn, at $1, . . .	250 00
150 bushels of oats, at 62½ cents, . .	93 75
Pasturage of 13 horned cattle, 26 weeks, at 33⅓ cents, ...	112 66
25 bushels of potatoes, at 50 cents, . .	12 50
20 bushels of apples, at 50 cents, . .	10 00
527 pounds of cheese, at 10 cents, . .	52 70
250 pounds of butter, at 20 cents, . .	50 00

10 tons of corn fodder, at $5, . . .	$50 00	
2 tons of oat straw, at $5, . . .	10 00	
250 loads of compost manure, . . .	250 00	
		$1,324 11

Expenditures:—

My own labor, 225 days, ...	$225 00	
Hired man 16 days in hay time, . .	20 00	
Grass seed, ...	6 00	
Seed corn, 1 bushel, ...	1 00	
Seed oats, 10 bushels, at 62½ cents, . .	6 25	
Seed potatoes, 2 bushels, at 50 cents, .	1 00	
1,000 pounds of plaster, ...	4 50	
75 bushels of oyster-shell lime, . . .	12 00	
250 loads of compost manure, . . .	250 00	
Interest on 69 acres tillage and mowing, at $50, ...	207 00	
Taxes, ...	27 00	
		759 75
Net profit, ...		$564 36

Hadley, October 4, 1854.

NORFOLK.

Report of the Committee.

The committee on farms announce with regret that but a single farm in the county was presented for their examination. This fact would seem to indicate an absence of laudable pride among the farmers of Norfolk. Scores of men show fine bulls, cows, and calves, horses, poultry, and pigs, and receive, as they deserve, commendation therefor; but the possession of a fine animal is, too often, a mere matter of accident,—a fortunate purchase, the happening in the neighborhood of a fine bull or stallion, or the like,—and too seldom the effect of systematic and judicious breeding. In fine, a man *may* sweep the show of prizes on stock, and yet be a very indifferent farmer; but when he exhibits a well-tilled and economically-managed farm in proof of his claim to the honorable title of a good farmer; its every acre of ploughed land and meadow, orchard and forest, hillside and plain; its snug farm house and kitchen garden, out houses and yards; its vehicles and farm implements; the farm horses or oxen in good condition for labor; the cows clean as cats, carrying home daily gallons of good milk; the swine examples of contentment and obesity; the very house dog, in his happiness, giving to his tail a hospitable wag,—all these declare, in language that cannot be mistaken and cannot deceive, the home of the thriving farmer.

Are there none such in Norfolk? This volume of the transactions of your society is your accredited ambassador to other counties, states, and countries, charged, it is presumed, to give as fair and favorable an account as facts will justify. The silent but eloquent envoy points with pride to the thriving condition of your association; to the immense concourse of persons who are annually attracted to your shows; to the noble array of live stock exhibited; the groaning tables heaped with luscious and tempting fruits, coaxed from an unfriendly soil, or forced during an intemperate season; the many and varied evidences of female taste, and skill, and perseverance; but what is said concerning *the farms* of Norfolk? Scarcely a syllable.

Now, it is not the fact that there are no longer farms in Norfolk county creditable to her farmers and worthy of commendation. There are many such; but their proprietors, we fear, are determined to keep them profoundly secret.

Farm of Dr. W. T. G. Morton, at West Needham.

The only farm presented for examination belongs to Dr. W. T. G. Morton; and it happened, unfortunately, that it was not presented within the time specified by the rules of the society. The committee, in consequence, are unable to award any premium.

They award to Dr. Morton a gratuity of twenty dollars.

The farm gave evidences of continued and well-directed labor; the buildings were all good and in good condition; the neat cattle were of excellent quality and in fine order; the swine, which are well and widely known in the United States, made good their claim to their high reputation; and the poultry, in many varieties and in immense numbers, did great credit to the doctor's "selection, breeding, and management."

A full account of Dr. Morton's farm, with its expenses and receipts, is appended. The minuteness of this account, and the careful manner in which it has been kept, reflect great credit upon Dr. Morton and Mr. G. H. P. Flagg, by whom it is prepared.

William S. King, *Chairman.*

Statement of Dr. Morton.

Gentlemen:—In consequence of the prevalent idea among farmers, that none but large and decidedly model farms are considered worthy of premium, I feel a good deal of reluctance in calling your attention to the small number of acres which I cultivate. But experience and observation having taught me that small farms make the largest relative dividend, I shall, in conformity with these views, submit a sketch of my agricultural operations for the past season.

My farm now contains sixty-six acres, and was the parsonage of this parish before it came into the hands of my family. Our first purchase included but six acres, whereon was a beautiful site for a building. This land was covered with bushes, and the low ground was miry. We immediately cleared and planted it. The ground was elevated in the centre, and on its highest point a thrifty oak, a foot in diameter, stood "solitary and alone." Here a two-story Gothic cottage was erected, of convenient size and shape. At the top of this cottage is a large reservoir, supplied with water by an hydraulic ram, raised thirty feet, from a running stream of spring water on the premises. This reservoir supplies with water the different rooms in every story of the house, and also a fountain in front of the mansion. It irrigates the flower and vegetable garden; supplies the tenant's house and horse stable; and, by the use of hose, can throw a stream of water over nearly all the buildings, (which, besides the above, consist of two tenements, a barn, horse stable, carriage house, tool house, piggery, henery, ice house, &c.) Some rods from the cottage, and on the north side, we erected the barn, fronting south, into a basin-shaped yard, connected with a roof over it of sufficient height to allow the sun to strike under. On the south side of this yard is the piggery, with sliding doors to connect with the barn yard. On the east and west sides of this yard are gates, by which we pass into one and drop the material for composting, and drive out of the other. It will be seen, by the annexed statement, that a good stock of hogs is kept through the year; and we manage, by scattering corn among the mud and manure, to make them perform most of the labor of composting. If they do not sufficiently mix muck and manure, we shut up the hogs by the sliding doors, and open both gates, and plough through and through, and then let them on again. The shed is covered; and no liquid but urine being there, any deficiency of moisture is made up by letting in water from a four-thousand-gallon cistern, supplied from the roofs of the out-buildings. These are so arranged that the water is conducted from all of them into the cistern, which is of wood, and stands above ground at a sufficient height to discharge water through a pipe into a trough in front of the cattle stalls, and also, when desirable, into the swill boiler.

These improvements have all been so uniformly done in the summer months, that, but for the stock, no help would have been required during the winter. There not having been, formerly, stock enough on the place to occupy all of one man's time, a lot of twenty acres (about half in wood) was purchased, with the view of the laborer's time being employed in winter, and cultivating the other half, which was done with great success; which I think will be conceded by the committee when they examine the annexed account of the results of the agricultural operations on the limited scale of the two pieces of land above mentioned.

With the view of arriving at definite conclusions as to the profit of cultivating the different crops, I have caused to be entered every night the labor and expense of each day in a Farm Record. From this book I put the entries under the separate heads, and have struck a balance, and transmit herewith a copy of the same, embracing every entry in detail, which the committee are at liberty to make such use of as they see fit.

We have not, until this fall, come into possession of the other part of the parsonage, embracing forty acres, a part of deep, sandy loam; the other part meadow, with plenty of muck, adjoining the six-acre plot; with mansion house, surrounded with old elms, a barn, and out-buildings suitable for occupation by a foreman, and at a convenient distance from the cottage.

The first step, this fall, on the forty-acre parcel, was to plough one-half of it thirteen inches deep with three yoke of cattle and dig five hundred cords of mud—which amount we ascertained by measuring the ditches. This sufficiently drained the low land. We are now carting it on to the light upland, which has been literally *skinned* for years; and the returning carts convey sandy gravel from under the barn, which will help reclaim the meadow, and leave a large manure and root cellar under and adjacent to the barn.

Although I have devoted much attention to the manufacture of composts, and intend in future to devote more, yet I have been endeavoring also, to test the more recently introduced fertilizers. In this connection I beg leave to introduce the following:—

Hay.—For the purpose of testing the comparative value of cow and concentrated manures as top-dressings for mowing lands, one and one-fourth acres were selected that had been laid down to grass three years, cutting, in ordinary seasons, from one and a half to two tons per acre. There is a fair subsoil; the surface is black loam; the subsoil yellow loam, gravel below. The land was divided into plots, and extended from moderately high to low ground.

No. 1 was dressed with coarse compost, at the rate of fifteen cords per acre. The expense in carting and spreading was three dollars and seventy-five cents for twenty-four thousand and seventy feet, or six dollars and seventy-five cents per acre.

No. 2 was dressed, while the snow was on the ground, with one hundred and seventy-six pounds of guano, costing five dollars and twenty-eight cents, or twelve dollars per acre—being at the rate of four hundred pounds per acre.

No. 3 was left without dressing, to show the natural yield of grass, and to give a standard of comparison.

Results.—In the early part of July, the grass from each plot was cured and weighed.

The grass from the manure plot shrunk forty-two per cent.

The grass from the guano plot shrunk forty-nine per cent.

The grass from the nothing plot shrunk fifty-two per cent.

The hay from each plot was weighed separately.

No. of plot.—Application to.	Cost per Acre.	Lbs. Hay per Acre.	Lbs. gain pr. Applic'tion.	Loss per Acre.
No. 1. 15 cords compost, one-half remaining unspent, .	$30 00	4,200	1,000	$22 00
No. 2. 400 lbs. guano, . . .	12 00	4,310	1,110	3 12
No. 3. Nothing, ...	–	3,200	–	–

Expenses of one acre of corn:—

15 cords of compost manure, ...	$60 00	
Carting out and spreading, . . .	10 50	
Ploughing and harrowing, ...	6 62	
Dropping manure, furrowing, and planting, .	11 25	
Ashing corn, ...	50	
Cultivating, ...	1 50	
Hoeing first time, ...	4 00	
Guano, super-phosphate of lime, and applying,	3 00	
Cultivating, ...	1 00	
Hoeing second time, ...	3 00	
Hoeing third time, ...	2 50	
Turnip seed and sowing, ...	62	
Harvesting, ...	7 00	
Interest on land, ...	4 41	
Taxes, ...	56	
		$116 46

Products:—

71 bushels of corn, at $1, ...	$71 00	
Husks and stalks, ...	10 00	
One-half of manure unspent, ...	30 00	
		111.00
Loss, ...		$5 46

Expenses of half an acre of potatoes:—

5 cords of manure,	$20 00	
Carting out and spreading,	3 50	
Ploughing and harrowing,	5 00	
Dropping manure, furrowing, and planting,	5 75	
Seed,	5 00	
Cultivating,	1 25	
Hoeing first time,	5 00	
Cultivating,	1 00	
Hoeing second time,	3 00	
Harvesting,	7 50	
Interest on land,	2 20	
Taxes,	28	
		$59 48

Products:—

98 bushels of potatoes,	$147 00	
One-half of manure unspent,	10 00	
		$157 00
		59 48
Profit,		$97 52

Expenses of half an acre of fodder corn:—

6 cords of compost manure,	$24 00	
Carting out and spreading,	2 00	
Ploughing and harrowing,	3 50	
Dropping manure, furrowing, and planting,	5 25	
Seed,	2 00	
Cultivating,	1 50	
Hoeing first time,	2 00	
Hoeing second time,	3 75	
Harvesting,	1 00	
Interest on land,	2 20	
Taxes,	28	
		$47 48

Products:—

5¾ tons of corn, (green,)	$50 00	
One-half of manure unspent,	12 00	
		$62 00
		47 43
Profit,		$14 57

Expenses of half an acre of carrots:—

10 cords of compost manure,	$40 00	
Carting out and spreading,	3 75	
Ploughing and harrowing,	4 00	
Dropping manure and preparing drills,	14 00	
Sowing seed by hand,	4 00	
Cultivating,	1 00	
Weeding first time,	6 00	
Weeding second time,	8 50	
Thinning out,	1 50	
Harvesting,	7 00	
Interest on land,	2 20	
Taxes,	28	
		$92 23

Products:—

350 bushels of carrots, at 37½ cents,	$131 25	
Tops,	3 00	
One-half of manure unspent,	20 00	
		$154 25
		92 23
Profit,		$62 02

Expenses of the sauce garden:—

4 cords of compost manure,	$16 00	
50 pounds of guano and 50 pounds of superphosphate of lime,	3 00	
Ploughing,	2 50	
Preparing ground and planting,	2 50	

Transplanting,	$2 62	
Weeding and hoeing,	5 00	
Harvesting,	2 00	
		$33 62

Products:—

One-half of manure unspent,	$8 00	
1 bushel of peas,	1 68	
3½ bushels of beans,	7 00	
58 ears of sweet corn,	58	
3,126 cucumbers,	15 63	
290 tomatoes,	2 13	
1,081 peppers,	5 40	
3 bushels of potatoes,	4 50	
2 bushels of parsnips, beets, and carrots,	1 00	
1 bushel of turnips,	50	
260 pounds of corn stover,	1 00	
2 bushels of melons,	2 00	
		$49 42
		33 62
Profit,		$15 80

Total amount of produce,	$6,045 37
Value of my stock and expenses,	4,635 33
Net profit,	$1,410 04

West Needham, 1854.

Besides the committee on farms, the Norfolk Society also appointed a committee to visit the various parts of the county for the special purpose of examining and reporting on the condition of farms not entered for premium.

That committee made the following

REPORT.

The object of this commission has not, it seems, been fully understood. It has been blended with that of the committee on farms; and as some individuals are members of both, there may be a confusion in their respective reports. Mr. King, from whose character, acquirements, and position great advantages might have been expected, has not been able, by reason of the multiplicity of his engagements elsewhere, to be present on several occasions when we have visited different sections of the county. We lamented this circumstance, as we had anticipated much assistance from so distinguished a friend of agriculture.

Another member of this committee, a man of great practical knowledge of farming operations, and deeply interested in the progress of our society, has been prevented by sickness from taking such a share in the work assigned us as he would gladly have assumed until the larger portion of the season had passed. The presence of both these gentlemen was indispensable to the proper performance of our duties and to the fulfilment of the society's expectations.

Notwithstanding these discouragements, enough has been seen and done to justify the appointment of this or some similar commission. It furnishes the means of seeing many of the best farmers in the county; learning their success, and the methods by which it was attained; witnessing their experiments and results; collecting and diffusing a knowledge of various practices and opinions; forming an acquaintance with the different soils, capacities, and productions of different portions of the county; studying the relations between agriculture and the mechanic arts, in which so many of our population are engaged; all of which objects are vital to the farming interests of the county. To be visited by such a committee gratifies many persons who from choice or by necessity seek retirement, and are seldom seen from home—men deserving of encouragement, and capable of imparting much sound agricultural information. Distant from the busier scenes of life, they not only foster the virtues essential to manly character, but they also often attain great practical skill in their profession. To them we are indebted for many valuable suggestions. Such a commission brings to many information respecting the society which they would not otherwise have, interests them in its objects and operations, gives opportunities for inquiries, explanations, and inducements to join us, and to make themselves and their doings known by coming to the society's meetings and exhibitions. It sometimes enables us to remove prejudices that have been formed against the society through misapprehension of its purposes. In many obvious ways it adds to the society's strength, benefits, and general prosperity. We have only made a beginning, and would recommend that another committee be appointed for the ensuing year, charged to commence operations in the spring and continue them to October; to make diligent and minute inquiries and report them in detail.

This committee visited a number of the best farms, especially in the north and west portions of the county, and gained valuable information respecting the cultivation of grains, potatoes, grass, fruit, and vegetables. Wherever we went we were courteously welcomed and hospitably entertained, and every where found facilities for acquiring the knowledge we sought. Our limited ability, arising from the circumstances mentioned above, prevents us from making such a detailed report as we could wish; but we saw abundant evidences of the improving condition of agriculture in the county. We saw a general disposition on the part of farmers to avail themselves of the agricultural information diffused by the society's reports and by weekly papers devoted to this subject; a willingness in many to overcome traditional prejudices, and to accept the improvements suggested by modern science; a desire to experiment with new manures and to test the expediency of new crops; a better appreciation of the importance of deep ploughing and thorough cultivation, and of the superior advantages of high-bred stock for the dairy; and a growing conviction that under suitable conditions, which are within the reach of most, farming may be a profitable business.

In some parts of the county less land is under tillage than formerly, much having been suffered to run up to wood. In poor soils this may be good policy; but, as an offset, a good deal has been effected in the recovery and cultivation of bogs and meadows, which often prove the most productive and profitable parts of the farm. More than ordinary attention is paid to the planting and care of orchards, as the farmers find a ready and remunerating sale of their products. Our attention has been called to several instances of eminent success in this department. It seems difficult, if not impossible, to overstock the market with good fruit. Fruit trees yield cheap and abundant increase of the common food for cattle and swine. Sweet apples, in particular, are nutritious and wholesome; milch cows are benefited by them; and we have seen beef of the greatest excellence which had been fattened entirely upon them. Farms well stocked with fruit trees are always more salable, and at much higher rates, than others. Indeed, instances are not wanting of farms in this county which have been enhanced in value from ten to thirty per cent. by the addition, within a few years, of a well-cultivated and thrifty orchard of grafted fruit. A remarkable example is furnished on the farm of Mr. Grant, in Wrentham; which we mention because that whole farm is a memorable instance of what may be accomplished by industry and economy. Ten years ago it was exhausted and scarcely worth cultivating. Mr. Grant has brought it into a highly flourishing condition; and every stranger notices the orchard as one of the most striking improvements. The improvement of pastures is going on extensively. A prejudice formerly existed against ploughing up old pastures, however mossy and miserable; but the impulse given to the manufacture of butter by continued high prices has induced an extensive and favorable change. Old pastures are ploughed, manured, cultivated, and laid down, furnishing abundant feed where once were only moss and weeds. Farmers are not so easily satisfied as formerly with the amount taken from the land. They have become better acquainted with the capabilities of the soil and with improved methods of working it; and, instead of thirty, they look for sixty bushels of corn at least from the acre, and other things in proportion. Of corn this is especially true. Besides those fields that were entered for premiums, we have seen many that promised remarkably large yields. Of these, we will specify (on account of its size and excellence) that of T. Motley, Jr., Esq., of West Roxbury. Mr. Motley had ten acres in corn, which it was thought late in September would yield at least eighty bushels to the acre. This, however, is only in keeping with other things on that farm, which in almost every respect challenges competition.

We also find that more than usual attention is given to the cultivation of roots, carrots, ruta-bagas, &c., as food for cattle. Farmers, like other men, experience difficulty in changing their course; and although practical men had learned that roots could be raised at the rate of from thirty to fifty tons per acre, and scientific men had proved that carrots from one acre would make more beef than hay from three, perhaps four, acres, still farmers hesitated at making the experiment. This was natural and right. The growing of roots is expensive; it was something to which farmers were not accustomed; and until the experiment was successfully performed under their eyes, they were justified in going forward with great caution in the new path. From the success that has attended the efforts of several of our most distinguished cultivators, it may reasonably be expected that more attention will be paid to this branch of agriculture, and that it will prove eminently profitable.

In this connection we would mention Mr. Motley's last year's crop of ruta-bagas—twenty-four hundred bushels from three acres. We have also seen the same land devoted to the same root this year. From its appearance in September, we judged it might yield an equal amount. We have observed good fields of ruta-bagas elsewhere, but, for extent, for evenness and thoroughness of cultivation, for its clean and beautiful appearance, none that equalled this.

We are gratified to notice the increasing patronage of agricultural papers, and the multiplication of books treating of farming, gardening, implements, and education. Farmers understand that, if they would improve their business, they must first improve themselves, and learn to cultivate the soil on principles established by science. The time has gone by when men laughed at book-farming. Agriculture, as an art, cannot be improved without a competent knowledge of its theory. The practical sagacity that accomplishes so much in difficult conditions has no insight into the mysteries of science. With a soil but moderately fertile, with high-priced and incompetent farm laborers, with the continued emigration of enterprising young men to cities or to the west, the farmer would do well to avail himself of all the resources of science, so that, with the same labor and outlay, he may largely increase his crops. Observation teaches that the best cultivated farms are the most profitable; that the land resents ill treatment; that money invested in manure, in deep ploughing, in minute pulverization of the soil, in repeated stirring of the surface devoted to grain crops and potatoes, comes back with interest. Similar remarks might be made respecting the choice and treatment of cows and cattle. Great light has been thrown on all these topics by papers and books, and the farmers of this county begin to appreciate the value of their instructions.

We have noticed that farming flourishes most in connection with the mechanic arts. These introduce a numerous population, which forms a home market for the productions of the farm. In places where there is no such population, the number of farmers decreases by emigration; the number of farms diminishes while their size increases; landed property accumulates in fewer hands; foreign laborers supply the place of natives; the number of persons profitably interested in agriculture becomes smaller; and the towns lose both wealth and influence. We consider it an advantage to the farmers to have so many flourishing mechanical and manufacturing establishments as now exist in this county. They furnish the farmers with inducements to cultivate the land in a better manner, to keep stock of a superior quality, and to increase the amount of fruit and vegetables, of milk and butter, for home consumption. A dense population tends to sustain prices and to counterbalance the present increased expense of farming operations.

We cannot but notice great improvements in the construction of farm buildings in different parts of the county. We regard this as an indication of increased interest as well as success in agriculture, and of more study and reflection upon the best methods of conducting its operations. Among those recently erected, we might specify the barn of Hon. B. V. French, in Braintree, as, for convenience and labor-saving, an almost faultless model. Few farmers, it is true, need or could afford so expensive a structure; but we would advise all, of whatever means, who intend to build, to examine Mr. French's barn, because, in our opinion, it is excelled by none in the county.

We would also call the attention of farmers to the improved implements of husbandry and labor-saving machines. This is a matter of vital consequence. While the price of labor is so high and the necessity of more thorough cultivation so apparent, it is of the first importance to obtain the best implements for performing the work of the farm, and the most approved machinery for saving the cost of it. The horse rake, which but a few years ago was regarded with ridicule, is now almost indispensable. The mower and reaper, though not yet fitted for common use, will, in an improved form, be of invaluable benefit and saving to every large farmer. The subsoil or subsod plough, once having small favor, is now fast gaining friends and advocates by its usefulness. Other improved implements are brought into notice by the inventors or sellers of them; and we recommend the examination and trial of them wherever they can be had.

We believe that a new impulse has been given to agriculture among us by the formation of our society. By its meetings, shows, premiums, and reports—by the intelligence it combines and diffuses—by the enterprise of its leading members—by the improvements it has suggested or made in the quality of stock and swine—it has fully justified its existence and merited the encomiums it receives from every quarter. It is instrumental in inducing men of wealth and energy to remove from the cities into the country—men who, by their means and efforts, contribute largely towards carrying forward the noble art which feeds the world. It is doing much in redeeming agriculture from the charge of empiricism, and advancing it, through its transitional states, towards the character of a perfected science.

Such are some of the reflections suggested by our recent observations. There is no evidence that the value of agricultural pursuits in Norfolk county has depreciated. On the contrary, it may safely be asserted, that, taking the whole body of farmers together, there has been no time within our remembrance when their labor was better paid, or enabled them to enjoy more of the comforts of life, or to give a better education to their children. A very few get rich; fewer still absolutely fail; while the many support themselves and families in all the essentials of comfort and respectability. Can more be said of any other calling?

We consider it to be within the scope of our commission to point out errors and deficiencies as well as excellences. It was our design to do both more minutely and specifically than we are now able to do. One or two instances have attracted our particular notice, and are of common occurrence.

Farmers here, as elsewhere, attempt the cultivation of too many acres with inadequate means. Large farms cannot be profitably cultivated without large capital. Both labor and fertilizing matters are lost by expanding them over too large a surface. Many an acre in this county might be made to yield double the returns now obtained from two acres cultivated in the usual way, and at much less expense. No error is more common, and none is at this time more hurtful to the farmer, than the endeavor to realize greater profits from many, than from few, acres.

Comparatively few farmers *know* the value of their business, or the amount bestowed upon and taken from the land. This results from the fact that they do not keep full and accurate accounts, and, of course, do not know what farming costs nor what it yields. A manufacturer of cotton cloth knows, to a mill, what a yard of cloth costs. Where the profits are small, it concerns him all the more to know this. Few farmers know what a pound of pork or butter costs, or what amount of hay and grain is required to make a hundred weight of beef. They can make a tolerably good guess; but an exact system of farm accounts would go a great way towards determining such questions, and, of course, towards settling the matter of the profitableness or unprofitableness of their business. Indeed, there is no other way by which a farmer can tell whether his plan of operations is judicious and profitable, and wherein it is defective. As the merchant, at the close of the year, takes an account of stock, charges himself with the interest of his capital, expenses, bad debts, losses, &c., and credits his business with goods on hand, profits, debts due, &c., so should the farmer, if he would understand precisely the value of his operations. Such a practice would tend to establish habits of order and economy, and furnish an additional source of interest in every operation connected with farming.

We have in mind an instance of such method and exactness of farm accounts by a young farmer in this county, which revealed to us at once the secret of his apparent success. His example affords a rebuke to many, and an incitement to all. So important to the farmer is the habit of keeping exact accounts, that we recommend to the society to withhold any premium which would otherwise be given to an individual whose accounts do not show the cost of the article presented for premium.

In connection with the cost of agricultural productions, the question is suggested, Why do we so seldom hear of apprentices to farmers? Is it because a knowledge of farming comes by nature, or because young men think that the time spent in apprenticeship would be lost? The present unusually high prices paid for ignorant and inefficient help would seem to indicate a different conclusion. We pay too much for what life and interest our common foreign laborers exhibit—too much for what is actually done—too much in proportion to the prices of what we sell from the farm. And as in all departments of manufacturing and mechanical pursuits skilful labor is found to be most profitable to the employer, may we not presume that such would be the case in farming—most profitable and most satisfactory to all parties? If this presumption is just, it would justify some of our enterprising young men in apprenticing themselves to the best farmers and gardeners, with a view to become thoroughly acquainted with the business both as an art and a science. We believe that ultimately they would be gainers by this course—would find steady and remunerating employment. Calls are now occasionally made for well-qualified young men to manage market-gardening establishments and large farms. And if such calls could be satisfactorily answered, no doubt they would be multiplied. With the increased interest now felt in agriculture in this vicinity, and the number of wealthy men engaged in it, there must be a growing demand for skilful labor. And would not such labor on a farm be as honorable as selling tape from behind a counter, and as profitable, in the long run, as mining in California? Besides, it would tend to raise and improve the character of all farming labor—to make it as reputable as it is indispensable. By the example and success of a few leading men, school teaching has been elevated to the rank and pay of a learned profession, and the eminent teacher takes his position among the foremost classes of society. Farming demands learning and talents, and will reward them. They will convert it from an empirical trade to a noble and dignified pursuit, and it will crown them with riches and honor. Our society will have gone a great way towards fulfilling the wishes of its enlightened founders when it shall persuade young men to devote to agriculture years of earnest and serious study—when thought shall be wedded to labor—when science applied to the cultivation of the soil shall redeem from unmerited contempt one of the most useful of human employments.

For the committee,

John M. Merrick.

RECLAIMED MEADOWS.

MIDDLESEX.

Statement of Asa G. Sheldon.

The land I offer for premium was, in 1843, a blueberry swamp, with some few maples and white pines, in value not more than ten dollars per acre. I first dug a ditch through the centre of it, about forty rods in length, which cost sixty cents per rod—making twenty dollars. Then I cut off the wood and brush, which barely paid for cutting. In the fall the manure was taken from the slaughter yard and barn cellar, teamed to a side hill near the swamp, and mixed with one load of strong manure and three loads of blue, clayey gravel. This was done in September. In the winter, when the swamp was frozen, this was teamed on, tipped up in loads, and then covered with sand. In April, 1844, it was all overhauled. In May I commenced digging over the swamp and planting potatoes, putting a small shovelful of this compost in a hill. I found the depth of mud to vary from eighteen inches to nine feet. Where I found the mud deep and good digging, I dug five or six feet deep, filling the holes with blackberry roots, small stumps, and hassocks within eighteen inches of the top, then covering it over with mud from the next hole and planting potatoes upon it. The clearing and planting were both done at once. The piece managed in this way was not less than two acres. A man would clear and plant from four to six square rods per day. Wages at that time were a dollar a day. Cost of clearing and planting, thirty-two dollars per acre; cost of ditch, ten dollars per acre—making in all forty-two dollars per acre. The crop of potatoes was not less than two hundred bushels per acre.

Grass seed was sown on the ground when the potatoes were dug, and the ground raked over. In 1845–6–7–8 and 9, making five years, it produced as good a crop of English hay as I ever raised upon any ground, without any manure except what was put on the first crop of potatoes. In 1850 the crop of grass began to fail, and some wild grass came in. In September, 1850, I ploughed it by hitching the plough behind a pair of wheels, so that the oxen could walk on the grass. In the winter, when it was frozen, I teamed on manure, all kinds being mixed, about four cords to the acre. I planted it in 1851 with potatoes; the crop was from three to five hundred bushels to the acre. Finding this much more profitable than hay, I have managed it in the same way until the present time. When the potatoes have been dug early, before they got their full growth, I have not obtained so large a crop. When they have been allowed to remain in the ground they have never failed of yielding three times as much as the upland.

The present season I invited the town clerk, with a number of other gentlemen, to witness the measurement of the ground and the digging and measurement of the potatoes. From this, which I enclose, you will see that the crop cannot be valued at less than three hundred dollars per acre—many having now been sold for more than one dollar and fifty cents per bushel.

WILMINGTON, October 2, 1854.

Statement of Joshua Webster.

The piece of swamp land inspected by you contains over ten acres. The surface is peat mud; the subsoil is a clean white sand. It formerly had a thick growth of birch, alders, and blueberry bushes. I commenced in 1851 to cut the birches and alders into cord wood, and realized, net, about two hundred dollars for the wood. I then commenced paring and burning, filling the holes and low places with parings and small bushes. I have planted most of it with corn and potatoes, and have had rye on a part of it, which did not do very well, owing to being sown too late. The corn and potatoes did very well, particularly on parts where a small quantity of manure was used. I consider the ditching very important, and should probably have done better had I thoroughly ditched the whole at the commencement, which I did not do. I have not kept an exact account of the expense, but estimate that fifty dollars, after deducting the crop, will cover the expense per acre. I consider ploughing, where it is practicable, better than paring and burning.

Malden, September, 1854.

Statement of William Buckminster.

I have taken three harvests of hay from the meadow which I enter for premium since I converted it to English mowing, and have secured not less than two tons of merchantable hay to the acre. My mode of turning this cranberry bog into English mowing ground was, to cover all the wild grass and vines with gravelly soil from the islands in it and the adjoining higher ground, having first cut ditches, to drain it completely, as nearly four rods asunder as the lay of the land would permit. I bury the whole matter on the surface without cutting; and I do this in August, because the loam, &c., carted on, kills out the wild growth more effectually at that season; and when the tops are completely buried, the old plants die much sooner than they would if cut with a scythe. I hauled on fifteen ox cart-loads per acre of compost manure, and sowed one peck per acre of herds grass and two pecks of red top. Late in the fall I sowed four quarts of northern clover, not meaning to have this vegetate before spring. Since the first sowing I have put on another dressing of compost equal to the first, and my crops continue good. I have mown this for the last three summers.

The old pine swamp with a peat bottom, one and a half miles off, was cleared in a different manner. The brush was cut, dried, and burned, and the pine stumps were dug out by the roots. This I find to be the only sure mode of subduing this swamp. The pine roots, extending far from the stumps just under the surface, are poisonous to the good grasses, and the low blackberry vine soon gets possession of the soil. I have now about four acres which I have thoroughly subdued in this way, and have taken from them three harvests of hay in the last three summers. The cost of subduing in this thorough manner, and sowing down, is full fifty dollars per acre, including the draining. I have here two hundred rods of ditching; and I have laid out the whole in plats of four rods in width. The whole meadow has a deep peat bottom.

The cost of covering the cranberry meadow with gravel was less. Some acres I can cover with earth for thirty dollars per acre. Mine cost me between thirty and forty.

FRAMINGHAM, September, 1854.

HAMPSHIRE.

Report of the Committee.

It is peculiarly fortunate when the performance of a particular duty harmonizes with the tastes of those who have to fulfil it; for then the mind, instead of dragging the slow length of its ideas along, moves with alacrity, and imparts to others a portion at least of the satisfaction which itself enjoys.

Such is the happy position of the committee. Mere swamps had been cold, wet, and dreary; but that word *reclaimed* not merely made our duty less irksome, but rendered it positively delightful. The idea of reclaiming any thing quickens the pulsation of every generous heart, because it presupposes a downward career and a tendency to the region of hopelessness; and to be instrumental in the extrication of any thing, spiritual, animal, or vegetable, from this dark abode, this mournful fate, must afford satisfaction to any one possessed of right feeling. The sensation of rescuing from hopelessness and restoring to utility can be no other than a pleasing one. Is it nothing to make the barren womb of earth to rejoice by causing it to be the fruitful mother of abundant produce? We have authority, which it would be impious to question, that there is more joy in heaven over one sinner that repenteth than over ninety and nine just persons that need no repentance. May we not reverentially adopt this Heaven-born sentiment, and, in the appropriation of it to our worldly affinities, venture to feel that there is more joy, not only in making two blades of grass grow where one grew before, but also in making one grow where none grew before, than there is in beholding the vast, immeasurable extent of indigenous vegetation, however luxuriant, that clothes the western prairie?

It is gratifying to observe the progress made for some time past in reclaiming waste and swamp lands. In the ten years, between 1840 and 1850, not less than two hundred and thirty-nine thousand nine hundred and eighty-seven acres were reclaimed and made productive throughout this State. The pasture land has been turned into mowing and tillage, and the unimproved land into pasturage or tillage.

The profit arising from reclaimed land is said to be, on an average, fifty per cent.; in some cases it is very large, and lands so reclaimed have become the best parts of the farms, yielding, in general, two good crops of first quality hay in a season.

A writer from Hampshire county, who is quoted by the Secretary of the State Board of Agriculture in his First Annual Report, gives the following process of reclaiming poor, worthless swamp lands:—

"In the first place," says he, "we drain them as dry as we can conveniently, and then we cut the surface over as even as possible, and in some cases we plough and level it. Then we draw on sand or gravel at the rate of about a cartload to a square rod of ground, and then cart on fifteen or twenty loads of good manure to the acre, and spread evenly over the ground, and then harrow it thoroughly; after that sow to herds grass, clover, and red-top seed. The latter part of August is considered the best time for seeding; but it will do very well later in the season."

JOSEPH SMITH.

Statement of Samuel Powers.

My piece of reclaimed swamp contains five acres, and it is situated on the county road, leading from Hadley to Amherst, at the foot of the hill, about half a mile from the former place. In 1837 I became the owner of the above land in connection with twenty acres, a part of which was improved land, and worth what the whole cost, leaving the portion I am about to offer for consideration, in its then condition, of little or no value. This worthless part first engaged my attention. Its soil is of that peculiar kind called *peat*, and is the product of accumulated vegetable matter. I resolved, if it were a practicable thing, to put it in a fit condition for cultivation; and, on taking its water level, I found that in a distance of sixty rods there was a fall of about two feet. This fact encouraged me to make the attempt to free it entirely of water. I cut a ditch, three feet in depth, at the foot of the hill, which carried off the water which the springs gushing from the hill sent forth. In addition to this, other ditches of equal dimensions were dug, encircling the entire piece, and one also through the centre. These ditches cleared the swamp of water. After the land had remained in this condition one year I proceeded to plough it with a team consisting of three yokes of oxen, attended by three stout men to guide the plough and turn the furrows. Three days were consumed in ploughing one acre, at an expense of twelve dollars. But the work was effectually done, the heavy swamp sods being turned over and buried eighteen inches deep after clearing the surface of the many roots and logs scattered over it. A drag and heavy cultivator were next applied, which gave the swamp before rough a smooth and level surface. The following spring, a smaller plough, drawn by a pair of horses, turned over the surface, not disturbing the thick turf covered over the year before. I first planted to potatoes, and obtained a large crop; second year planted Indian corn, and had an abundant crop; third year planted broom corn, and had an abundant crop. In looking over my minutes of the income derived during the first three years of its improvement, after making a fair deduction of all expenses for manure and labor, I find that my receipts exceed the expenditure over eighty dollars.

Since that time, a period of fourteen years, the land has been constantly planted to broom corn, and has produced crops equal in value to the best meadow soils, while only about five loads of manure were used to the acre, and applied in the hill, which has kept it in a good state of cultivation. It yields as good crops, and is as beautiful in appearance, and as productive, as any land in the vicinity.

HADLEY, October 17, 1854.

Statement of John A. Morton.

My piece of meadow land contains one and a half acres. The soil is in part peat mud and in part a clayey subsoil. It was in pasture, covered with brush, coarse grass, and water. In the fall of 1851 I ploughed the lot in which this land lies to the depth of seven inches. I then cut drains around the wet part, the ditches running north and south about two rods apart, the fall being sufficient to carry off the water. I planted it to corn in the spring of 1852, manured in the hill with ten loads to the acre, and the yield was thirty bushels to the acre. In the spring of 1853 I ploughed in fifteen loads of sheep manure to the acre, and again planted to corn with ten loads of compost manure in the hill. The corn grew large, and was considerably injured by the wind in August. The ground being soft, the corn was turned out by the roots. I raised over fifty bushels of corn per acre. I sowed the piece to oats the 1st of June, 1854, and sowed twelve quarts of timothy grass seed and three pounds of clover to the acre. The oats were light; the seeding looks well. The land I consider worth fifty dollars per acre, which was nearly worthless when I came in possession of it. I think the great secret in reclaiming land is, to get off all the water, and then plough deep, and bring up the soil, whatever it may be, to the action of the sun and air. I will now give the value of the crop on one acre for the last three years :—

Products :—

Two years in corn, 80 bushels, at 92 cents,	$73 60	
4 tons of corn fodder, at $5, . . .	20 00	
20 bushels of oats, at 60 cents, . . .	10 00	
		$103 60

Expenses :—

Cutting brush and preparing the land to plough, ...	$5 00	
90 rods of drain, at 12½ cents, . . .	11 25	
Ploughing and harrowing, ...	6 00	
Seed corn and oats, ...	2 00	
Hay seed, ...	1 25	
35 loads of manure, ...	35 00	
Planting, hoeing, and harvesting, . .	15 00	
		75 50

Profit on crop, ...	$28 10
Increased value of the land, ...	40 00
Total gain, ...	$68 10

Statement of Avery D. Hubbard.

My swamp contains about five acres, one acre of which I offer for the examination of the committee. Previous to my coming in possession it was drained around the edge, and was so dry as to permit a team on it in a dry time. It bore a small quantity of coarse sage grass, barely sufficient to pay for cutting. At that time I offered the land for sixteen dollars an acre. Becoming satisfied that it was too wet to improve, I let a man cut a drain for the muck, thus dividing my swamp, and leaving little more than an acre in the lot I have reclaimed. On about twenty rods of the least boggy part I cleared off the bogs and wood, and carted on sand and a little horse manure, sowing on a quart or two of herds grass seed, a kind of red top coming up around the bogs. It has produced two heavy crops of grass a year till this year, when the drought so affected the rowen that I have fed it down. In the spring of 1853 I took twenty-seven rods more, cleared off the bogs and wood, and planted with potatoes, putting a little lime in the hill; and I had a fair growth, though a good many potatoes rotted. In July, 1853, I took off the sage grass from the remainder and set fire to it. In about a week it had burned all over, and had also burned about four inches of the muck. I thus entirely cleared the land of bogs, and the stumps were so loose that a yoke of small cattle removed them from the piece without difficulty. With a hoe I levelled down where the roots came out, and, on the 9th of August, sowed about a pint of turnip seed and six quarts of herds grass seed. There was a fair crop of turnips, and the grass looked fine in the fall. In May it looked well, and a number of good judges who saw it said it promised fair to be the heaviest crop of herds grass they ever saw. But the dry weather hurt it. Still, a number thought it would yield two tons to the acre; but, being at quite a distance from any scales it was not weighed.

The spring being very wet and backward, I did not plant the piece I had potatoes on last year till the 13th of June. I spread on about eight horse-loads of compost, made of muck and sand, two bushels of ashes, one bushel of oyster shell lime, twenty-five pounds of plaster, and half a cord of horse manure. I also put in the hill four loads of sand and muck from the drain. There were no weeds on the piece either year; so I used no cultivator on it.

Produce in 1853:—

Potatoes, (most of them rotting,) . .	$3 00	
120 bushels of turnips, ...	20 00	
1,000 pounds of hay, (two crops,) . .	4 50	
		$27 50

Produce in 1854:—

3,300 pounds of hay, ...	$16 50

9 bushels of corn,	$9 00	
800 pounds of corn fodder, at $5 per ton,	2 00	
Fall feed,	2 00	
		$29 50
Total produce in 1853 and 1854,		$57 00

Expenses in 1853 :—

Bogging, above the worth of bogs,	$1 50	
Planting, hoeing, and digging potatoes,	2 50	
Seed potatoes and herds grass seed,	1 00	
Carting on sand and gravel,	50	
Levelling and raking in grass and turnip seed,	1 25	
Grass and turnip seed,	50	
Pulling turnips,	5 00	
		12 25

Expenses in 1854 :—

Ploughing, carting on manure and sand, and planting,	$2 00	
Manure, ashes, plaster, lime, and seed corn,	2 75	
Hoeing and harvesting corn,	2 00	
Cutting, curing, and carting grass,	3 00	
		9 75
Total expenses in 1853 and 1854,		$22 00
Net gain on one acre,		$35 00
Increased value of an acre,		65 00
Total gain,		$100 00

SUNDERLAND, October 16, 1854.

HOUSATONIC.

Report of the Committee.

E. F. Ensign, Ralph Taylor, and J. R. Lawton, a committee appointed by the Housatonic Agricultural Society, in 1851, to view and report upon the "greatest improvement made upon wet, swampy, and unproductive lands, by bringing the same into a state of cultivation and productiveness with the least expense," report:—

That five pieces of "wet and swampy" land were entered for premium in 1851, and were viewed by your committee in the fall of that year, and have been reviewed this year. We premise by saying that none of the applicants have strictly complied with the regulations of the society in keeping and producing to the committee "a correct account of the expense of reclaiming, a description of the manner of improving," &c. Your committee believe the intention of the society to be, that an account should be opened with each lot of land to be improved, and that *all expenses* incurred, and the value of *all products* received, during the three years' experiment, should be accurately kept and exhibited to the committee, to enable them to judge and report to the society the value of the improvement. Lands may cost, in the improvement, more than their value after the labor is performed. The object of the society in offering premiums is, not to encourage a mere tasteful expenditure of money to beautify the farm, but the far higher one of making two spires of grass grow where but one or none grew before—of removing the unsightly blotches from our glorious landscapes—of encouraging industry and enterprise—and of proving to our young farmers that "virgin lands," which have not been worn out by unskilful cultivation, may be found without seeking the prairies of the west. In our opinion, there are many acres on nearly every farm in Berkshire, now valueless by being drowned and covered with bogs, which might, with reasonable expense, be made more productive than the most cherished acres now in cultivation. To enable any committee to judge with entire satisfaction, and to recommend the best mode of reclaiming lands, such an account as they have spoken of should be exhibited; and they request all who shall hereafter ask premiums to be careful to read the act upon the "regulations" of the society.

E. F. Ensign, *Chairman.*

NORFOLK.

Report of the Committee.

The committee of the Norfolk County Agricultural Society, upon improving meadow and swamp lands, respectfully report:—

That B. F. Dudley, of Milton, has requested their attention to a lot of land upon his farm in that town which he has reclaimed, and for his results desires a premium. Mr. Dudley requested the chairman to visit the land, which he accordingly did on the 29th of June last, whilst the crop of grass was on the land, after it was cut. It appeared of fine quality and in great abundance; and if Mr. Dudley can succeed in more thoroughly effecting his drainage through the adjoining piece not belonging to him, there is reason to believe that his improvement may be rewarded with permanent returns hereafter quite as great as those of the present year. His statement is subjoined. In view of the success of Mr. Dudley, and of the pains he has been at, as well as of the fact that this is the first application that has been made for two years in the county for a premium on this account, your committee recommend that the premium of fifteen dollars be awarded.

C. F. Adams, *Chairman.*

Statement of B. F. Dudley.

The lot of land to which this statement refers contains one and one-fourth acres and twenty-four rods. It is situated in the midst of the most valuable part of the farm, at the base of a steep hill. It was completely saturated with water oozing from numerous springs.

The subsoil was clay, covered with a soil which appeared to be composed of nearly equal parts of earth and vegetable matter, averaging about one foot in depth.

The natural products of this land were brake, meadow cabbage, moss, &c. It was free from stumps, bushes, and stones.

In September, 1852, it was ploughed nearly a foot deep, in some places reaching the subsoil. Owing to a press of work, the drains were not made until after the first ploughing. A margin drain was cut along the base of the hill of sufficient depth to cut off the springs; also a centre drain three feet wide and eighteen inches deep. Two cross drains were opened from the margin to the centre.

The centre drain was left open; the margin and cross drains were covered. About one-third of an acre of this land, lying on the side of the centre drain, opposite the hill, was so situated that a margin ditch could not be cut; and it was, therefore, laid down in beds.

The meadow received no further attention until June, 1853, when it was cross ploughed, and the remains of the turf piled and burned. In August the large quantity of ashes remaining on the ground was spread, the land manured, harrowed, and on some portions of it the cultivator was used.

About the 15th of August it was sown with herds grass, red top, and English turnip, bushed and rolled.

The crop of turnips was gathered the first of November. June 28, 1854, I commenced cutting the grass. That which was mown first remained in the field until the 3d of July, protected from the dew at night by hay covers.

The remainder was in the field five days; and, the weather being fine, the hay was thoroughly made.

September 1st the second crop was cut, and on the 8th it was put into the barn.

The following is a statement of the expenses and value of the crops:—

Expenses:—

First ploughing, ...	$30 00
Second "	14 00
Draining, ...	16 00
Piling and burning turf, ...	6 00

Three and one-half cords pig manure, and carting,	$21 00	
Spreading turf ashes and manure,	1 50	
Grass and turnip seed,	3 12	
Sowing, harrowing, &c.,	5 00	
Harvesting hay, at $5 per ton,	32 50	
" turnips,	6 00	
		$135 12

Value of the crops:—

307 bushels of turnips, at 20 cents,	$61 40	
4 tons and 1,862 pounds of first crop of hay, at $21 per ton,	103 46	
1 ton and 1,140 pounds of hay, at $19 per ton,	29 83	
		194 69
Expense,		135 12
Net profit,		$59 57

MILTON, 1854.

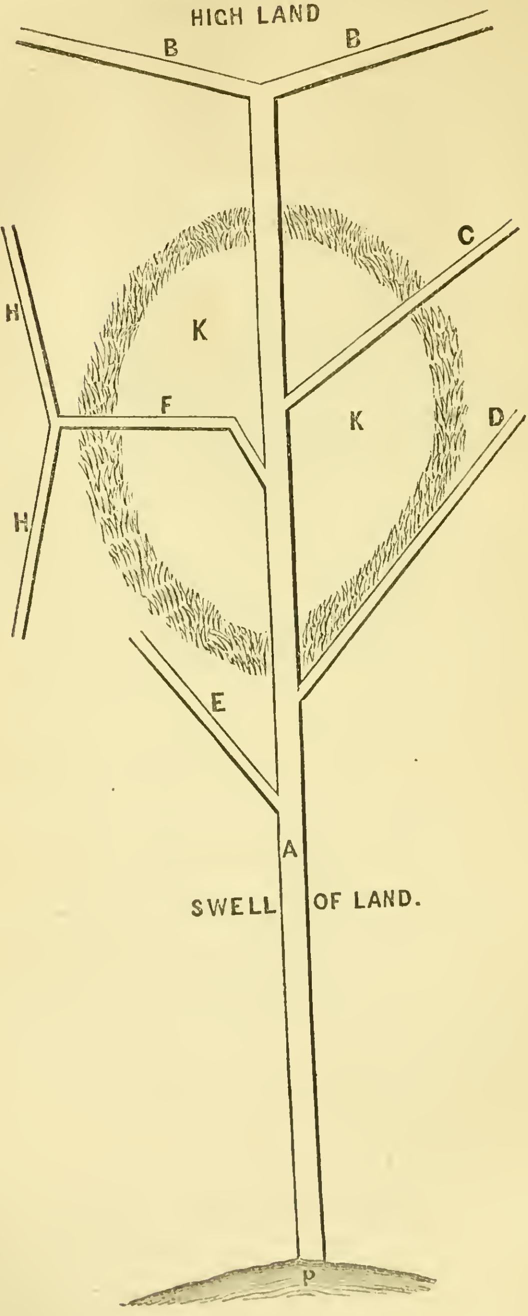
UNDER DRAINAGE.

[From the Transactions of the Essex Society.]

It may not be improper in this connection to state the result of an experiment in underdraining, entered for premium, but too late to be examined by the committee. It being the first of the kind ever presented to the society, it is submitted by the secretary as a valuable and interesting paper.

Statement of Ephraim Brown.

The following is an account of an experiment in underdraining completed by me two years ago this fall; the accompanying diagram is a representation of the land and the drains, which, after two years' trial, have proved entirely successful.


HIGH LAND
B
B
C
H
K
F
K
D
H
E
A
SWELL OF LAND.
P

Explanation.—K is the land drained. Formerly there was an open drain where the main drain now is, running nearly the whole length, to draw off the surface water. This drain caused the loss of nearly a rod of land in width for its entire length, besides being a great inconvenience in ploughing and working around it, as it completely divided the field, and by no means drained the land so as to admit of cultivating it. The soil was so very wet and swampy that it was difficult to cross it with a team, even in the dryest time, being at all times filled with the cold water from the high land springs. In the spring it was generally covered with water, and, in fact, it was an entire waste, besides subjecting me to the expense and inconvenience of this open drain.

A is the main drain, four hundred and fifty feet long from the drains B on the side of the high land to P, the harbor; it is about three and a half feet deep except between the harbor and the drain E, where, in consequence of a swell in the land, it is about six feet deep. This drain is made eighteen inches wide at the bottom; jamb rocks are laid on each side and bridged over with flat rocks, leaving a flue beneath. The whole is then covered a foot deep with small stones, which being again covered slightly with fine shingle ballast* from the beach to prevent the dirt sifting among the stones, the earth is shovelled in and levelled off.

B B are two arms from the head of the main drain, each seventy-five feet long, extending across the side of the high land.

C is a drain one hundred feet long, extending into the side of the high land.

D is a drain one hundred and twenty-five feet long, extending along the side of the same high lands as C.

E is a drain seventy-five feet long, extending into the high land on the other side of the main drain.

F is a drain seventy-five feet long, extending into the high land.

H H are two arms from the head of the drain F, each seventy-five feet long, and extend along the side of the high land. All the drains leading into the main drain are from three to five feet deep, and made from ten to twelve inches wide at the bottom, with flat stones placed carefully at the bottom, inclined together at the top so as to form an opening for the water. These are covered twelve to eighteen inches deep with small stones, which are again covered slightly with the shingle ballast named above. The drains are then filled up with earth and levelled off.

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* Shingle ballast is the small stones worn smooth by the action of the waves and driven upon the sea shore.

The land through which these drains are made, after getting through the soil, is a very hard, gravelly subsoil, which has to be all picked up with a pickaxe.

I did not keep an account of the cost of this drainage, as it was all done by the men employed upon my farm; but, considering the hardness of the subsoil and the unusual depth that it was necessary to make there on account of the location, I think they would cost one dollar per rod.

These drains have admirably accomplished the purpose for which they were made, having perfectly freed the land from all the high land springs, and thereby leaving it the best land in the field, so that it can be ploughed and planted with the rest of the field. Last year I planted cabbages and carrots on this land, and had good crops. This year I have carrots and onions on it, and part of the crop of onions which I have entered for premium this fall grew upon this very spot, which, till last year, has never produced any thing; and I see no reason why these drains should not continue to produce the same results for all time to come, as they are entirely below and out of the way of all frost.

I put in about one thousand feet of under drains last fall, and am putting in about four thousand feet this fall, the result of which will appear hereafter.

MARBLEHEAD, November 15, 1854.

PASTURE LANDS.

ESSEX.

From the Report of the Committee.

The committee on improving pasture lands report:—

That but one entry was made, and that at a recent date; to the examination of this the attention of the committee was called immediately after the notice of the entry was communicated to the chairman.

This entry was made by Jonathan Berry, of Middleton, whose statement, herewith submitted, will exhibit the former state of the land, and the course of improvement adopted.

The land, located in a swale, is of oblong shape, bordered on one side and end by highways, on the other side by the Essex Railroad, and the remaining side by land of the owner, partly reclaimed and partly in its natural state. It was in various states of improvement—from the rough state, after two ploughings, to a smooth surface, well set in grass. The bushes in all seemed to have been well eradicated, and the stones, with the exception of a few scattering bowlders, removed from their beds, and collected in locations convenient for removal, or already taken from the lot, as the owner found opportunity for sale or use.

This state of the land afforded the committee a favorable opportunity of judging of its former condition, and of its promise of future production, and also of the adaptedness of the course of improvement adopted by Mr. Berry to produce the desired effect.

The committee were fully of opinion that the course adopted was judicious, and its execution thorough, but, upon considering what would be the future use of the land, were of opinion that it would be better adapted for field than pasture cultivation. Upon this view of the case, and the probable meaning of the society in offering the premiums on improved pasture land, doubts were entertained of the propriety of considering this case as one contemplated in the offer—which doubts were strengthened and confirmed by recurring to the opening remarks of the committee published by the society in the Transactions of last year.

Your committee, therefore, believing this case not within the intent of the offered premiums of the society, but fully impressed with the merit of the experiment, recommend that the statement of Mr. Berry be published in the Transactions of the society, and a gratuity of eight dollars be awarded to him.

While we are gratified in noticing improvements in tillage and mowing land in various parts of the county, it is but seldom we are favored with the sight of equal improvement in grazing lands.

In a former report of a committee of this society on this subject the deterioration of our pastures was adverted to and enforced by noticing the increased allowance of land to the animal; and, in a more recent report and accompanying statement, remarks and facts are imbodied which may be useful for the consideration of those of us who have deteriorated pastures.

The writer of this was gratified to learn that one of the trustees was about to try the effect of sheep grazing upon old pastures, and has great confidence in the success of the experiment.

As practical experience is more satisfactory than theoretical speculations, the writer will only relate the experience he has had in the amelioration of pasture lands, which, though only partially applied on a small scale, may lead to more extended and satisfactory experiments.

In the early part of the summer of 1853, guano, mixed with an equal quantity of plaster, was applied as a top dressing to pasture lands, with some visible effect on the herbage for that season, and extended in a smaller degree to the present summer, but not in sufficient improvement to continue the experiment under similar circumstances—it being applied *after* the spring rains.

Plaster has also been applied on the surface without any marked effect. Leached ashes have also been used as a top dressing, with more marked benefit than either of the others, and had the effect of eradicating moss, and introducing white clover, and materially increasing the grass where applied.

Some small experiments in scarifying the surface and scattering grass seed over it have also been made, with results rather encouraging. With tools adapted to the purpose, it is believed much may be done in this way to improve and renovate our worn-out pastures.

This subject commends itself to the committee, as deserving the continued, if not increased, attention of the society; and it is hoped that the farmers of Essex may be stimulated to increased efforts to improve in this branch of husbandry.

JOSIAH LITTLE, *Chairman.*

Statement of Jonathan Berry.

The piece of land which I offer for your inspection, containing some six or seven acres, when I purchased the farm, in 1841, was of little or no value, as it was nearly covered with alder, blueberry bushes, lambkill, brakes, besides rocks in any quantity. In the first place I subdued the alders by mowing; I then removed most of the large stones, and sold about twenty-eight dollars' worth, which paid all the expense of getting them out. In 1851 I ploughed about four acres. In 1852 I cross ploughed and harrowed the same. In 1853 I ploughed two acres of the same, and spread on about twenty loads of barn manure, and sowed it with millet. It yielded three tons, the land being very uneven, and not fine enough for so small a seed. In 1854 I ploughed four acres, and on the two acres previously sown I spread one hundred and fifty bushels of leached ashes, and sowed it with millet and hay seed; and I obtained four tons of millet. I planted one acre with potatoes; it yielded about thirty bushels, having suffered severely from the drought. The remainder of the lot is not fully subdued; but I hope, by continuing to plough, I shall get it in good order. The lot will be seeded down and mown until it is well swarded, and then fed as a pasture.

I have not kept any account of the expense, as I have done the work as I had leisure, and have not thought, until recently, of entering it for premium; but I feel satisfied it will eventually pay good interest. In 1843–4–5 I subdued four or five acres similar to this, which I think have paid well, as the stones always sell when any one has them ready, and bring enough to pay all the expense of getting them out, as on low grounds they lie near the surface.

I have tried plaster on my pastures, but without receiving any perceptible benefit.

MIDDLETON, November 3, 1854.

ORCHARDS.

MIDDLESEX.

From the Report of the Committee on Farms.

In the apple orchards of Messrs. Brown and Buckminster, of Framingham, Horace H. Bigelow, of Marlboro', Wm. B. Harris, of North Woburn, Luther Adams, of West Townsend, George M. Barrett, of Concord, H. C. Merriam, of Tewksbury, Hiram Woodis, of South Reading, and Mr. Nightingale, of Groton, we had pleasing evidence of excellent success in the planting and training of fruit trees. Having in a former report spoken of the deleterious effect of strong alkaline washes upon apple trees, we are inclined to believe that a better practice is now prevailing in the use of washes, which, while they *cleanse* the trees, do not act upon them chemically. An unnatural color of the bark of a tree is, to our eyes, as offensive as a cosmetic upon the face of beauty. In the orchard of Mr. Woodis, of South Reading, we think may be seen the beau ideal of an apple orchard. If any thing can be objected to it, it is only that it is a little "too fine." The uniformity of shape, exactness of position, and correspondence in height afford an almost painful instance of monotony. We will only add that this orchard was a kind of pet of the individual who set it out—Mr. Moses Sweetser, of South Reading, a gentleman of great taste and skill in this department, and whose orchards, planted many years ago, will long remain as beautiful monuments to his memory.

Statement of James W. Brown.

My orchard of four hundred and seventy-five apple trees was set in the spring of 1847. The trees, at the time of setting, were one, two and three years from the graft, about an equal number of each. The soil is light and warm, with a gravelly and sandy subsoil. The holes for planting the trees were dug six feet in diameter and eighteen inches deep. The soil was thrown in, and the trees were dressed with a compost of peat mud, loam, dry ashes, and a small quantity of barn manure. The trees have received, about five times in seven years, a light top dressing of peat mud and loam. They have been washed four times in seven years. In July last I applied a wash composed of two gallons of water, one quart of soft soap, and one-fourth of a pound of potash. This wash answers every purpose, and does not in the least injure the youngest trees. I pruned the orchard in June, and the largest cuttings are healing finely. I have taken much pains to keep the trees clear of the caterpillars, and army and web-worm, the last two of which have scarcely made their appearance with me this season. Late in June I discovered a caterpillar's nest high up in one of the largest trees. With difficulty I removed it, only on account of its unsightliness, but found within the folds of the web forty-two cocoons ready to send forth as many insects, to lay the foundation of much mischief for the ensuing year. An old caterpillar's nest should never be left upon the tree through the season; it shelters the cocoon and increases the labors of the cultivator.

The drought during this season has been unprecedented. We have had but one rain of any account for the past ten weeks. My trees, however, are still growing, while the corn around them is for the most part dead. This thriving condition of the orchard is owing to deep ploughing in the spring and frequent hoeing through the summer. The soil has been ploughed five times during the seven years since the trees were planted. I shall never lay it down to grain or grass.

I passed through the orchard to-day twice diagonally from the four corners, and measured in course thirty-four trees each way, and the growth of the limbs and circumference at the surface of the ground. I measured no shoots or sprouts,—there are none in the orchard,—but the ends of the limbs, pulled down from as high as I could reach. The average growth the present season of the sixty-eight trees measured—and they are a fair average of the whole—is twenty and one-fourth inches. The average circumference of the same trees at the ground is a small fraction less than seventeen inches. The largest trees, not falling within the diagonals, were not measured.

Last year I sold sixty dollars' worth of apples from these trees, besides a large quantity kept for the use of my family, twenty-five in number. At this time about one hundred and twenty-five of the trees have apples upon them, and with ordinary rains I think several of them would produce one barrel each the present year. The principal varieties are the Baldwin, Greening, and Hubbardston Nonesuch.

The orchard was planted, has been pruned, washed, and for the most part hoed and kept clear of insects, by my own hands.

The Middlesex Agricultural Society awarded me the third premium in 1849, and the second premium in 1851.

FRAMINGHAM, August 26, 1854.

Statement of H. H. Bigelow.

My apple orchard contains one hundred and ninety-two trees, standing on four and one-quarter acres of land. The soil is a deep, dark loam, and was very rocky before the trees were set out. The land was dug and ploughed, the rocks removed, and the holes dug for the trees in the fall of 1850, and the trees were set out the April following. The holes were dug about twenty inches deep, and from five to seven feet wide. and two rods apart each way—the best part of the soil being laid by itself, to put around the roots after mixing with it about two bushels of compost manure to each tree. Care was taken that the trees were set at the same depth they were before being transplanted, and that the roots were spread and arranged in their natural position. The land was planted with corn the same year and the following, and hay was put round the trees to keep the ground moist; but I removed it in the fall for fear of mice, and put compost manure instead, to support the trees and keep the soil warm during the winter, spreading it upon the land in the spring. I have washed the trees with potash water once, one pound of potash to a pailful of water. I think too frequent washing not good for the trees. I have trimmed the trees thus far in the months of May and June. I never was troubled much by borers or caterpillars. The trees are mostly Baldwins, and were two years from the bud when set out.

MARLBORO', September, 1854.

Statement of William Buckminster.

My trees are of the Baldwin variety, and were set in the spring of 1852, three hundred in number, on about three acres of land. I set my apple trees twenty-five feet asunder, and keep the soil tilled while the trees are young.

When the trees were set, two years ago, they were all mulched with straw and poor hay. This mulching around the trunks three feet each way kept the soil moist and light for the young roots to take hold and extend themselves, checking the evaporation of the hot summer days, and supporting the trees sufficiently without being tied to a stake.

I placed flat stones on the straw, &c., to keep the same in place through the summer, and before winter I banked up many of the trees, burying the straw so deep as to keep away the mice. When I did not bury the mulching, I scraped it away before winter so that the mice could form no nests about them. I prefer banking up before winter to removing the mulching, as it supports the tree, and assists in forming a light mould in the spring, to be spread out in May.

In regard to trimming, you will see that I have left many limbs till this time which are now to be trimmed. I choose to have an abundance of limbs and leaves in summer, in case the tree is well rooted; for, the more healthy limbs and leaves you have, the more will the trunk of the tree increase through the summer season. But now the limbs will extend no more this season; and this is the time to thin out branches and reduce the top. Now is the time when the greatest quantity of sap-wood is made, and of course wounds heal sooner than at any other season of the year; yet I avoid excessive trimming at any one time, and choose to lop off some of the branches annually.

A number of my trees are bearing fruit, though this is but the third year of their standing in the orchard. Many of the trees have not yet ceased to put out leaves, though the summer has been excessively dry, and many of the trees have lost some of their leaves. Cultivation alone has kept the soil moist enough, for no artificial watering has been resorted to.

Framingham, September 5, 1854.

Statement of Hiram Woodis.

My orchard contains two acres of land, with one hundred and three apple trees, all Baldwins except ten or twelve trees, which are different kinds of fruit. They are set two rods apart, with peach trees between part of them, and were set in the spring of 1851. In shaping the trees I have taken off the centre stalk, and trimmed them in such a manner that they resemble each other, and the limbs are high enough to be ploughed under with ease. The land is good, and has been kept in a good state of cultivation, raising corn and potatoes, and this year is covered with onions, cabbages, and sage. I make it a rule to trim my trees every May or June; of the two months, I prefer June. I manure my crops liberally, and throw it about the roots of the trees. The manure used is composed of muck and barn manure, mixed together. I have never been troubled with borers, and seldom with insects of any kind.

South Reading, August, 1854.

Statement of George M. Barrett.

My apple trees, numbering about one hundred and seventy-five, which I offer for premium, were raised by myself, and set out when two years from the bud, in the spring of 1849, on a piece of land containing about four acres of a sandy and gravelly soil, which I considered worthless; but as it lay right before my door, I thought I would cover it with apple trees, and see if I could not make it look better, and have succeeded beyond my expectations. The land was prepared by ploughing, and followed by a subsoil plough to the depth of about twenty inches; the trees were then set in rows, two rods apart each way, and a little compost manure placed about them. I put a little hay about the trees the two first seasons to keep the ground moist till they got well rooted, the land being very dry. The land has been tilled with a crop of corn, potatoes, beans, or something of the kind, every year, and has received a light spreading of compost manure. I usually put two shovelfuls of compost about each tree late in the fall, to protect them against mice during the winter.

Concord, September 4, 1854.

HAMPSHIRE.

Report of the Committee.

The cultivation of fruit trees in Massachusetts has not generally received the attention which so important a subject justly demands. This will be found emphatically true of central and western Massachusetts—the beautiful valley of the Connecticut not even affording a general exception to this remark. The want of good fruit of the various species and varieties has been suffered to continue quite too long. The spirit of progress and improvement which so eminently marks the present age is beginning to be felt in this direction. Here and there may be found gardeners and farmers who have, within the past few years, demonstrated that the luxury of good fruits of the various kinds may be universally enjoyed. Let these demonstrations, though few and far between, beget a speedy determination in all the proprietors of the soil, that have not already done so, to engage at once in the cultivation of fruit trees, and thus secure as a home production what you are now so fond of sharing with your more enterprising neighbors or friends, whether in your own town or more remotely situated.

In looking over the report of the committee on fruit trees made last year by its accomplished chairman, Professor W. C. Fowler, and published in the Transactions of the Hampshire County Agricultural Society for 1853, the present chairman of your committee finds that the subject was treated on this wise, to wit: I. Plant a nursery; II. Select the ground for your orchard and fruit garden carefully; III. Prepare your ground carefully; IV. Plant your trees carefully; V. Tend your trees carefully. He having considered these several topics in their order, it is proposed on this occasion to present a few suggestions concerning some of the more desirable varieties of fruits. Some seem inclined to multiply varieties, more especially of apples and pears, without paying due regard to the qualities thereof.

Don, in his work on English Gardening, published in 1832, gives fourteen hundred varieties of the apple. The number has been greatly enlarged since, so that there are now about two thousand cultivated varieties.

Before proceeding to the enumeration of certain varieties which it is desirable to cultivate, it should be remarked that every farmer, in making his selection, should be governed by the use which he designs to make of them—how many, for example, he wants for baking, drying, sauce, cider, dessert, and for other uses; also, if he designs to raise apples for the market, to select such varieties as will sell most readily and for the highest prices. Early fruits, if located near the place of market, will be found most profitable; but if remote from the place of sale, autumn and winter varieties will be found more profitable. In selecting, you should have regard to varieties whose trees are vigorous growers and good bearers. There are some of the choicest varieties whose growth is feeble and products meagre. The alphabetical list of the choice varieties which follows will be found of service to all interested in fruit culture in our society:—

Summer Apples.—American Summer Pearmain, ripe in September; Red Astrachan, ripe in August; Benoni, ripe in August; Large Yellow Bough, ripe in August; Bohanan, August to October; Early Harvest, July; Early Strawberry, August; Early Joe, last of August; Lyman's Large Summer, August; Manomet, August to September; Summer Bellefleur, (superior,) late summer apple; Sops of Wine, August to September; and Williams's Favorite, August.

Autumn Apples.—Autumn Swaar, known as "Sweet Swaar," ripe in October and November; Cooper, October to December; Fall Pippin, October to December; Gravenstein, September to October; Hawley, September to October; Jewett's Red; Maiden's Blush, September to October; Northern Sweet, an excellent sweet apple; Porter, September; Republican Pippin; St. Lawrence, October; Spice Sweet, September; and Superb Sweet, September to October.

Winter Apples.—American Golden Russet; Baldwin; Baily Sweet, (superior,) October to January; Blue Pearmain, very popular in market from October to January; Bellflower, Yellow, November to April; Belmont, October to February; Danvers Winter Sweet, keeps till April; Dutch Mignonne, November to March; Fameuse, November to January; Hubbardston Nonesuch, November to January; Jonathan, November to April; Lady Apple, November to May, sells for the highest prices in market; Lady's Sweet, November to May; Mother, November to January; Norton's Melon, (superior,) October to April; Northern Spy, a superior apple, retaining its freshness of flavor and appearance till July; Newtown Pippin, November to June; Peck's Pleasant, November to April; Pomme Grise, November to April; Rambo, keeps till February; Red Canada, November to May; Rhode Island Greening; Russet, Golden American; Swaar, November to May; Seek-no-farther, November to February; Spitzenburg Æsopus, November to April; Spitzenburg Newton; Tallman Sweeting, November to April; Wagener, December to May; Willow Twig, long keeper; White Winter Calville, November to March.

Apples for Ornament or Preserving.—Red Siberian Crab, and Large do., ripe from September to October; Yellow Siberian Crab, and Large Yellow Crab; and the Double Flowering China, a beautiful ornamental tree.

Pears.—Very little attention has been given to the cultivation of this most delicious and desirable fruit. If you will prepare your soil by supplying such manurial specifics as are requisite, such as bone dust, ashes, salt, lime, &c., you may be as certain of producing pears as apples. A short list of some of the best varieties is furnished:—

Summer Pears.—Bloodgood, ripe in August; Beurré Giffart, August; Dearborn's Seedling, August; Doyenne d'Été, August; Madeline, the earliest variety; Rosticzer Tyson.

Autumn Pears.—Beurré Diel, October and November; Golden Beurré, of Bilboa, September and October; Duchesse d'Orleans, October; Doyenne, White, October and November; Doyenne, Gray; Flemish Beauty, September and October; Henry the Fourth, September; Louise Bonne de Jersey, September and October; Napoleon, November and December; Seckel; Stevens's Genesee, September and October; Swan's Orange, October and November; Bartlett, last of September.

Winter Pears.—Beurré d'Aremberg, December to January; Beurré, Easter, keeps till spring; Beurré Gris d'Hiver Nouveau, November to January; Glout Morceau, December; Lawrence, November to February; Vicar of Winkfield, November to January.

For Cooking, either Baking or Stewing.—Cattillac, Easter Bergamot, and Pound, all keep through winter, if desired.

Nearly all these choice varieties may be grafted on the quince, and succeed well. Would it not be well, then, for our farmers to graft some of their quince trees? It is hoped they will do so.

Quinces.—This fruit is very common here. The best varieties are the orange, pear-shaped, Portugal, and Angers—the last being the best variety for pear stocks.

Peaches.—A few select varieties: Bergen's Yellow, September; Yellow Rareripe, September; Coles' Early Red, August; Cooledge's Favorite, August; Crawford's Early, September; Crawford's Late Melocoton, September; Early York, August; George the Fourth, August; Grosse Mignonne, August; Jaques' Rareripe; Large Early York, August; Late Admirable, September; Morris's White; Morris's Red Rareripe; Red Cheek Melocoton, September; Snow Peach, September; Weld's Freestone, October; Lemon Cling, September; Old Mixon Clingstone, September.

Grapes.—Selected. Catawba, Isabella, Black Cluster, Black Prince, Black Hamburg, and White Sweetwater.

In making this selection of the more choice and desirable varieties of fruits, Barry's "Fruit Garden" has been frequently referred to—a work recommended to all fruit growers.

The committee desire, in taking leave of this *fruitful* subject, to press home to the mind of every proprietor of a garden spot or farm in western Massachusetts the importance of fruit culture. Then, ere long, this region will become as noted for producing an ample supply of the choicest varieties of fruits as it has been hitherto for the lack of them.

L. WETHERELL, *Chairman.*

Statement of Theodore Pasco.

I have eighty-one trees of grafted fruit, in one location, on an acre and a quarter of land. A part stand on loamy, and the remainder on sandy, soil. I have also twenty-three scattered and ungrafted trees. The trees in my orchard were grafted, six or seven feet from the ground, twelve years after they were set. Most of them are twenty feet apart; but I think it would be better if the distance was twenty-eight or thirty feet. The land they stand on has never been ploughed since they were set; for my opinion is, that turning over the soil around the trees two or three feet from them, and throwing on compost manure plentifully, is preferable to ploughing. Young trees standing on land that is often ploughed at first will look very thrifty and grow fast; but soon the roots are badly injured, and the result is, the appearance of the orchard is sadly changed. My varieties of fruit are Greenings, Baldwins, Roxbury Russets, Shaker Russets, Gillyflowers, Seek-no-farthers, Winter Sweets, Golden Sweets, Gennetings, Pumpkin Sweets, Spitzenburgs, Pound Royals, and several varieties of early apples. I have gathered this year from my grafted trees one hundred and eighty-one bushels of good winter fruit, thirty bushels of fall apples, and one hundred and fifty bushels of cider apples.

HADLEY, October 16, 1854.

Statement of Nathaniel Smith.

My orchard, which I offer for a premium, has over seventy-five trees. About twenty of them are thirty years old; but the remainder are young trees, some of which are in bearing this year. The old trees were grafted after they were set out. The soil is sandy loam, deep and rich. The old part is in grass; broom corn is cultivated on the other part. The manure used is common compost; and the quantity of apples is probably about one hundred and fifty bushels, valued this year from forty-five to fifty dollars. The value of the fruit was much reduced by the hail storm in September. My varieties are, Early Harvest, Porter, Congress, Greenings, two kinds of Russets, Baldwins, Seek-no-farthers, Bellflowers, Little Core, Swaar, Gravenstein, Æsopus Spitzenburg, Crows' Eggs, Golden Sweets, and other varieties too numerous to mention.

I came in possession of the place last spring, and, therefore, am not able to state the cost of the orchard.

SUNDERLAND, October 17, 1854.

Statement of Avery D. Hubbard.

The land on which my orchard stands is sandy and light. I have twenty-five trees which have been reclaimed. Their ages vary from forty to more than a hundred years. Twenty years ago they were almost worthless—grown up with sprouts and dead limbs—not having been trimmed for many years—bearing only a few "cider apples"—none of them having been grafted or budded. The trees were thoroughly trimmed and all the dead limbs cut off. We were careful to shape them well and have handsome tops. The trees were scraped with a hoe till all the old and loose bark and moss were removed, and a compost of swamp muck, ashes, plaster, and lime, was spread under the trees, and thoroughly mixed with the soil by ploughing. Most of them stood on ploughed land.

In a few years a thrifty set of shoots came out, which were grafted with Baldwins, Greenings, Spitzenburgs, Seek-no-farthers, Roxbury Russets, Nonesuch, Boston Russets, Pippins,

&c. For several years they have borne apples enough for our family use; and I have sold some for several years till the last year, when the worms injured them some, though not so much but that we had a number of bushels of winter apples. This year they have borne very full and very nice apples. The number of bushels I am unable to state, as we have kept no account. We have some very early apples, which were ready for market in July; and I am satisfied we have sold apples enough this year to pay all the expense of reclaiming the orchard. In regard to manure, I have found that any thing that will make corn grow will make apple trees grow and produce apples. Work manure well into the soil, as far round as the limbs extend. I think every farmer especially, and all who own land, had better set out a young orchard, unless they already have done so. But if you have an old orchard, go to work and reclaim it, and in a few years you may have all the apples you will need in your family till your young trees begin to bear.

SUNDERLAND, October 16, 1854.

Statement of Daniel Cowles.

I have about forty peach trees. The principal part of them were grown from peach stones that I obtained of a grocer in Springfield in 1839. He had saved them from a few very choice lots of peaches that had been brought in to him. They were planted in the fall of 1839; and in the spring of 1842 I set them about the sides and terraces of my garden, where I thought they would do the least damage. I have practised putting ashes about the roots occasionally in the fore part of the season. The greater part of the trees bear the early yellow peach. Some bear a peach very much resembling the Early Crawford, and there are three or four varieties of later peaches. I have a few young trees of different varieties—the snow peach, the blood peach, &c. My trees have borne well every year since they were three years old excepting one, but not as well this season as last. I have had this season from fifteen to twenty bushels. The peaches were not as large and good as usual this year—owing, I think, to the dry weather.

HADLEY, September, 1854.

Statement of Melzar Hunt.

My nursery contains one hundred and fifty apple trees of different varieties—the Baldwin, Greening, Roxbury Russet, Hubbardston Nonesuch, Bellflower, Winter Sweet, Russet, &c. Most of them are three years old from the bud or graft.

My method of raising trees is, to sow the seed in the fall, in drills—the rows three feet apart, and the trees six inches apart in the rows. In April, after they have grown one year from the bud, I transplant them, setting them two feet apart in the rows. The budding is done when the trees are of a suitable size, which is generally the second year. The ground on which the trees are grown is spaded every spring, and hoed as often as necessary to keep it from weeds. I cultivate some other crop between the rows of trees, either carrots or potatoes.

SUNDERLAND, October 15, 1854.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of Edward Clark.

The young orchard at Rocky Hill was set out five years ago, and contains two hundred and seventy-two trees, mostly Baldwins; the old orchard has one hundred and sixty-eight trees—making together four hundred and forty.

The manner of planting the trees was, to dig the holes four feet in diameter and about two and a half feet deep. The poor dirt was thrown aside, and the good soil returned, with about a load of compost made from muck, warmed up with bone dust and ashes. I think I have twice planted a few hills of potatoes around each tree with good effect, as the crop more than paid for the labor, and the trees were kept free from weeds, which I consider of great importance. Otherwise the land has been cultivated in the usual way, with the exception of avoiding crops of rye, which are too exhausting for the orchard.

Many years ago, a friend of mine set out eighty apple trees, and employed a man, (an Englishman I believe,) well acquainted with his business, to do the work of planting. When his first day's work was done, he asked him how many he had set out. His reply was, "*eight, sir.*" This seemed to his employer so small a number that he paid him without allowing him to go on with the work, but the next day engaged another man to finish the job. When night came, he put the same question to him. He replied that he had set out all that remained. As time rolled on, the gentleman found that the first eight trees were worth the whole seventy-two. I presume my trees were set out after the manner of the eight.

The most of my trees were of the size costing from seventeen to eighteen cents each. Many of them now measure three and a half inches in diameter, and but few probably less than two and a half to three inches.

NORTHAMPTON, October 2, 1854.

Statement of Benjamin Barrett.

The orchard to which your attention is called is situated at the foot of Round Hill, directly in the rear of my dwelling house, on Prospect Street, having a north-easterly and south-westerly slope. Its position for the culture of fruit trees is probably not surpassed by any locality in this part of the Commonwealth. The lot is very productive, and, at present, in a high state of cultivation. The soil consists mostly of a rich dark loam, mixed in some degree with gravel. In some places is found a blue, clayey subsoil, and in others a wet, heavy soil. Most of the lot, however, is of a warm and dry character and of a highly productive quality.

My homestead, of which this orchard forms a part, consists of four acres, and came into my possession in 1845, and was purchased for the sum of five thousand dollars. The premises are divided as follows: three acres are occupied by the orchard, one-quarter of an acre by the buildings, and the remainder is appropriated to the general purposes of a garden and fruit yard, in which are growing grapes, raspberries, gooseberries, strawberries, currants, and other fruits.

At the time of my purchase of the place there was standing thereon an orchard, consisting mostly of old trees, with a few young grafted ones. My first effort was made to regenerate the orchard, by reclaiming the unproductive land on which it was situated, and increasing the wealth of the soil. To this end blind ditches, three feet deep, were dug on intersecting lines through the lot, filled with stone, carefully placed so as to form a small culvert or open passage for the water throughout the whole course of the drains. The surface was deeply spaded and ploughed, and liberally supplied with sand, loam, and manure of various kinds. The trees, which showed few signs of vitality, were cut down and removed; and the remainder, under the process of scraping and pruning and by the improved quality of the soil, were revived and stimulated to a vigorous growth. Such as did not bear good marketable fruit were grafted; and several of the young trees, of a size from six to eight inches in diameter, were successfully transplanted. All survived the removal, and most of them were in full blossom and bore fair fruit the first year. They were, however, taken up, with very little disturbance of their roots, and removed with great care.

This orchard has been constantly supplied from year to year with new varieties of trees, some from my own nursery, and others from other sources. Upon these varieties, introduced since my purchase of the place, I mainly rely for my best fruit.

The orchard now contains one hundred and seventy apple trees, two hundred and fifty peach trees, forty pear trees, one hundred and twenty-five quince trees, thirty-five plum trees, and twenty-five cherry trees, besides some apricots and English and common walnuts.

In the selection of trees, I have aimed to obtain such varieties as would yield a constant supply of fruit through each successive season of the year. My early fruit trees are decidedly the most profitable—their fruit always commanding a ready market and a good price. This season, my early apples—which are the first in market—were sold, some at one dollar, and some at two dollars, per bushel; and most of my winter apples, such as the Baldwin, Russets, Greenings, Bellflower, and Newtown Pippin were sold on the trees for one dollar per barrel. Pears and plums sold at one and two dollars, and quinces at seventy-five cents and one dollar.

To enumerate the varieties of my apples, or to enter into a detailed statement of expenditures bestowed upon the orchard, would occupy too much of your attention. Suffice it to say, that at the late fair in Northampton I exhibited eighty-three varieties of apples, mostly grown on the premises above described; and allow me further to add, that the income of last year—which is only an average with other years—from the homestead, was seven hundred dollars. The first crop of grass growing on the ground occupied by the orchard yielded two and one-half tons per acre, and was sold standing for seventeen dollars and fifty cents per acre. The second crop yielded about two tons, and was sold for thirty-six dollars.

It is impossible for me to give you an accurate statement of the amount of expenditure I have made in bringing my orchard into its present state of perfection. I consider the whole estate as increased in value far beyond the measure of expenditures; and I may be allowed to state, in evidence of this, that in 1850 I received an offer of nine thousand dollars, and during the last year one of ten thousand dollars, for the premises—both of which offers were declined.

In order to secure success and profit in the cultivation of fruit trees, a few things are deemed indispensable:—

1st. *The Mode of Cultivation.*—The process by which the culture of fruit is to be carried on is precisely like that for corn and potatoes. The ground must be well prepared and made mellow by subsoiling and double spading. It is only by such means that the roots of the trees are able to travel unobstructed in every direction in search of food, and that light and warmth are admitted into the bosom of the soil in which they find their residence and support. In young orchards the tillage should be deep and thorough, without fear of injury to the roots; with old trees, however, the treatment of the soil must be more gentle; and I would neither recommend the disturbance of the ground to a great depth, nor ploughing near the body of the tree. These elder members of the family must not be disturbed in their position and habits; and you cannot descend rudely among their unwieldy and full-grown roots without injury to the health, if not danger to the life, of the tree. Careful and repeated spading around the trunk, from three to four feet distance, is, in my opinion, all that is safe or proper, with perhaps occasional deep trenching at the extremity of the roots.

2d. *Appropriate Manuring.*—This I regard as the *sine qua non,* not only in fruit culture, but in all agricultural experiment. The earth must be replenished with the appropriate nutrition, and the elements fit and adapted to the growth and development of the plant. No one can expect, with any reason, to grow fine trees or good fruit without abundance of manure; it is vital to their growth and flourishing condition. I freely make the application of manure to my orchard every year, and adapt its different kinds to the different portions of the ground and kind of trees growing thereon, as shall best afford the appropriate food. Compost manure and unleached ashes I have used with great success. Every alternate year I spread broadcast over my lands, barn-yard manure to the amount of twenty-five loads to the acre. Hen dung mixed with loam and vegetable matter is also applied more or less freely around and near the roots of the peach trees; and coal ashes, also, I find very valuable in destroying the worms. As advised, I have applied iron filings about my pear trees. In all other respects my peach and pear trees have been treated like the other trees in the orchard. Frequently the surface of the trunks is scraped thoroughly and well washed in soap and water, as I think with great advantage to their thrifty growth. This year I have placed about the body of the trees meadow muck; the grass and turf of which it was in part composed were turned under so as to cover the mass—thus forming a warm bed for the roots during winter, and forming a stock of food for the season of reanimation.

In the mode of cultivation thus adopted, my trees require but little, if any, watering; and I have found no necessity of mulching—a process under ordinary circumstances beneficial, but, in my case, incompatible with the ground crops.

No one, I believe, who has tried the experiment, will doubt the value and utility of abundant manuring on fruit-growing grounds. Our orchards fail and their fruit deteriorates only because of lack of nutrition and skilful treatment.

3d. *Transplanting Trees.*—The holes must be broad and deep—three feet at least in diameter, and from one to two feet in depth, varying according to the size of the tree and the roots. The subsoil should be thrown aside, and the upper soil reserved for the bottom of the hole. If the soil removed is poor, or mixed with clay, the hole must be larger and deeper for the admission of foreign loam and compost. The good earth is then to be placed at the bottom of the hole to form a basis for the tree. Carefully trim the top and roots with a knife as far preferable to a saw. Then set the tree into the hole just deep enough to secure the perfect covering of the upper roots; spread out the small fibrous roots in their natural direction; and then throw the rich loam and the upper soil on and about the roots, carefully pulverized and pressed in and among the same by the hand and foot. Then add the subsoil, taking care, in finishing the work, to leave the surface sloping towards the trunk of the tree. As to distance or space between the trees, I recommend two rods for apple trees, and one rod for peach and pear trees.

The practice of placing apple trees and peach trees alternately I fully approve, for the reason that the peach tree is short lived, and will ordinarily die out before the apple tree becomes of sufficient size to be incommoded by their presence.

4th. *Proper Pruning.*—All harsh and indiscriminate trimming and all deep and severe scraping must be avoided. The true principle of pruning consists in so making removals that all the remaining limbs and branches shall be left entirely free and unobstructed in their movements, and that no opening through to the light above be left clear and vacant among the branches. All crotchets and double branches must be reduced, even at the expense of half the limbs. The head of the tree must be early and judiciously formed, well balanced and well stocked for self-support, sufficiently elevated to permit cultivation and free passing under it. The body should be erect, the branches regularly extended throughout, and those protruding too far should be shortened, to preserve uniformity in the shape of the tree; all friction among the limbs must be avoided by removing the offending member. The top thus formed and disposed will admit the rain and air and light upon the upper and lower branches alike, thus distributing in equal and just proportion the influences which are to mature and ripen the fruit.

Pear trees require little or no pruning except when young. Young and thrifty peach trees should be pruned at least twice a year. Early in June the exuberant growth should be checked by topping, thus reserving the vital forces for the development of buds and fruit nearer to the central strength of the tree; and again, in August, another topping should be resorted to for a like reason. We wish to secure good, rich fruit instead of wood and leaves.

These views are in accordance with my experience in the management of fruit trees, and are submitted for the benefit of any who may be disposed to make improvements in this useful branch of agriculture.

FOREST TREES.

HAMPSHIRE.

Report of the Committee.

Notwithstanding the liberal premium offered from year to year by the society for the best plantation of forest trees,—consisting of white oak, yellow oak, locust, white ash, or white pine, not more than three years old, and of not less than one thousand trees, produced from seed,—no competitors have yet appeared to claim it. Now, if he is worthy of being called a benefactor who makes two blades of grass grow where but one grew before, then should he be called a good economist, to say the least, who causes to grow three thousand white pines on a sandy acre that has not produced a single blade of grass for a quarter of a century.

The whole area of the State is said to contain four million four hundred and ninety-one thousand eight hundred and twelve acres. Of this, according to the returns made about ten years since, from which we copy, there were seven hundred and twenty-nine thousand seven hundred and ninety-two acres of woodlands. Besides this there were reported nine hundred and ninety-five thousand acres of unimproved lands, and three hundred and sixty thousand of unimprovable; in all, two million forty-four thousand seven hundred and ninety-two acres, or nearly one-half of the entire area of the State not under improvement—a remarkable fact, it would seem, in one of the oldest and most densely-populated States in the Union.

It is deemed fair to state that a large share of this unimproved and what is denominated unimprovable land may be rendered productive by planting suitable seeds of native trees. The number of species of native timber-trees in Massachusetts is greater than that of any kingdom in Europe. Of the oak species there are nine, of hickories four, birches five, maples three, ashes three, pines three, walnuts two, elms two, spruces two, cedars two; besides the beech, chestnut, hornbeam, lever wood, tupelo, nettle tree, tulip, plane, bass, locust, hemlock, fir, hackmatack, cherry, holly, poplars, willows, and numerous smaller trees. In addition to these, there are many of the species of Europe that will grow here, besides others in the Middle and Western States. In view of this great number of timber and wood-producing species, nearly every kind of unimproved, including much of what is denominated unimprovable, lands can be rendered productive of wood and timber.

The quantity of wood and timber, owing to the great demand, is annually growing less and less in this State, and consequently timber and wood, and the lands producing them, becoming more and more valuable. Hence a reason for forest-planting and culture. There are many acres of unproductive lands of different kinds in western Massachusetts that might in this way be made productive and valuable. In view of the facts that the demand for wood and timber is annually increasing, and prices advancing, and of there being so much unproductive land in the State, it is proposed to present considerations which, if heeded, will convert the hundred s of thousands of acres of unimproved and non-productive lands of the State into wood and timber-producing lands—thus enabling the State to produce within its own narrow bounds what is sought abroad at high prices. By introducing this mode of improvement, the lands are made better, and timber will, ere long, be furnished for house-building, ship-building, fence-making, furniture, implements of various kinds, bark for tanning, and fuel for the fire. These may be considered good and substantial reasons for doing what has been done, and may, therefore, be done again, under the direction and influence of knowledge, enterprise, and enlightened public economy.

The subject is one of such immense magnitude and interest, and the space allowed for this report so limited, that we can present only a very few reasons for engaging in the economical enterprise of forest-planting. There are many who will object to this on the same ground that others have done to planting fruit trees, to wit: the fear that they shall not live to enjoy the benefits of the improvement thus anticipated. How selfish and narrow minded is such an objection! Plan as if you were to live always, and live as if you might die on the morrow. Then will you prove yourself a benefactor of mankind, and posterity will rise up and call you blessed. But your objection, giving it all its force, is not well founded; for the first Duke John of Athol, Scotland, saw a British frigate built of larch of his own planting.

Athol, situated in the north of Scotland, latitude 57° north, contained the estates of the dukes. Duke James planted, between 1740 and 1750, more than twelve hundred larch trees in various situations, for the purpose of trying this species, then new in Scotland. In 1759 he planted seven hundred larches, over a surface of twenty-nine Scotch acres, intermixed with other kinds of forest trees. This plantation was upon a hillside from two hundred to four hundred feet above the sea level. The ground was rocky, and covered with loose masses of mica slate, the whole ground not worth three pounds sterling a year. His successor, John, first conceived the idea of planting the larch, to the exclusion of all other species, upon the hillsides about Dunkeld. Before his death he planted over four hundred acres on the sterile hillsides of his estate. His son, Duke John, continued his father's plans. His father died in 1774, and in 1783 the young duke had planted two hundred and seventy-nine thousand trees. Between 1786 and 1791 he planted six hundred and eighty acres with five hundred thousand larches.

Thus he continued to prosecute the work of larch-planting upon the barren hillsides until 1826, when he and his predecessors had planted more than fourteen millions of larch trees, covering more than ten thousand acres. It is estimated that a forest planted with larches will in seventy-two years from the time of planting furnish timber for building the largest ships. Before this time the trees will have been thinned, leaving about four hundred trees to an acre. Allowing fifty cubic feet of timber to a tree, at a shilling a foot, and you will have the product of one thousand pounds sterling per acre, of the poorest land, consisting of rocks and shivered fragments of schist. It is stated that the white larch on the duke's plantation, sixteen hundred feet above sea level, eighty years after it was planted, produced three hundred cubic feet of timber fit for any use. The larch is superior to the Scotch pine, and will in half a century make as much wood as the pine will in a century. The Scotch larch resembles the American larch, or hackmatack, as it is called.

There is much sandy land in central Massachusetts that might successfully be planted with the seeds of the white pine, which is a rapid grower. The cones mature so that they may be gathered in the winter, and they do not open so that the seeds can escape by Nature's processes until early spring—the best time for artificial sowing. The seeds, says Loudon, require from thirty to fifty days to germinate, and sometimes do not come up until the succeeding spring, and even later. Until the fifth year they are of very slow growth, and require protection; after which the growth is rapid—increasing from one to three feet annually. Moses Field, of Leverett, a member of the committee, to whom we are indebted for specimens of the annual growth of several species of forest trees, left with us a white pine whose growth equalled two feet nine inches last year, and two feet eleven inches the past season.

The white pine has been cultivated both in England and France, and has been found to grow in height from fifteen inches to three feet annually for sixty years. A tree planted near Paris grew eighty feet in height and nine feet in circumference in thirty years. The whorl of limbs encircling the trunk marks its annual growth. Says Mr. Emerson, in his Report on Trees and Shrubs in Massachusetts, "In 1809 or '10, a belt of pines and other trees was planted on two sides of the Botanic Garden in Cambridge, to protect it from north-west winds. When they had been growing thirty-one years, ten of the white pines, measured by myself, exhibited an average of twenty inches in diameter at the ground. The two largest measured five feet seven inches in circumference at the ground. One in Hingham, at the age of thirty-two, measured seven feet in circumference at the ground and sixty-two feet six inches in height—averaging annually nearly an inch in diameter and two feet in height."

We might, did space allow, give the results of oak plantations and trees of other species, all tending to encourage forest-planting. In closing, we give, as one more incentive to tree culture, the results of the growth of the different species of an English plantation of six acres for twenty years. The soil was wet and swampy, resting upon a substratum of gravel.

		Average feet in height.	Average circum. ft.	in.
Lombardy Poplar,	*Populus dilatata,*	60 to 80	4	8
Abele,	*Populus alba,*	50 to 70	4	6
Plane,	*Platanus occidentalis,*	50 to 60	3	6
Locust,	*Robinia acacia,*	50 to 60	2	4
Elm,	*Ulmus campestris,*	40 to 60	3	6
Chestnut,	*Castanea vesca,*	30 to 50	2	9
White Pine,	*Pinus strobus,*	30 to 50	2	5
Spruce,	*Abies communis,*	30 to 50	2	2
Larch,	*Larix communis,*	50 to 60	3	10

Who of the members of the society will commence an experiment in forest tree-planting, and thus render productive his worn-out and unproductive lands? By so doing he will render the "old homestead" more of a gem, and prove himself a provident husbandman.

L. Wetherell, *Chairman.*

HEDGES.

NORFOLK.

Report of the Committee.

The desire to combine the pleasing with the useful, to surround one's self with objects which are agreeable to the eye and gratifying to a refined taste, naturally springs up and strengthens in the breast as man advances in intellectual culture. A perfectly plain edifice may answer the bare wants of nature, may keep out wind and rain; but if a little architectural beauty can be secured, or a little ornament be added, without a sacrifice of convenience, something is gained in point of rational enjoyment. So in the disposition and management of grounds; grace, proportion, harmony, and variety of beautiful forms, secured by the introduction of clumps of well-chosen trees and shrubs, and in other ways, are deserving of attention, not only as furnishing an innocent pleasure, but as tending to refine and elevate the mind and feelings. The arrangements of a farm, even, should give evidence of a regard to something beyond and above the mere coarser wants of existence.

A well-set and well-kept hedge combines, in an eminent dedree, the two elements of utility and beauty. To an American, the green hedges of Old England constitute one of the most pleasing features in the landscape of that country, so fresh and beautiful. Your committee rejoice to believe that there is a growing appreciation of their advantages, and an increased attention to their culture, among ourselves.

The abundance and cheapness of materials suitable for walls and fences, with other considerations, will long prevent our farms from exhibiting the tasteful appearance of those of the mother country, which have enjoyed the benefits of centuries of culture and improvement. Still we have ornamental grounds, and wealth will seek more and more to diffuse itself over the surface of our soil in creations of beauty as well as of utility. The taste for rural occupations and enjoyment of the pleasant airs of the country will lead to improvements both attractive to the eye and dear to the affections. There is no reason why the beauty of a green and well-cut hedge, taking the place of ugly walls and fences, should be overlooked; and it will not be. Foliage is always beautiful, and the eye seeks it and rests upon it with delight.

In the discharge of the duty assigned them, your committee have visited the grounds of two gentlemen—Capt. Daniel C. Bacon, of Jamaica Plain, and C. B. Shaw, Esq., of Dedham. The hedges on these grounds have been all under the care of Mr. Robert Watt, and bear evidence of his peculiar taste and skill. Your committee took great pleasure in visiting both these places. On both, the hedges exceed the length of one thousand feet required for a premium.

The materials used by Capt. Bacon for his hedges are the buckthorn, the privet, or prim, and the arbor vitæ. For division lines between lots or contiguous grounds, the privet forms a very pretty and graceful hedge. Its small, delicate leaves, often thickly set, are pleasing to the eye, and have the advantage of remaining on the stem and preserving their verdure longer than those of most plants or shrubs. In parts of England the privet is an evergreen; and even here it is not uncommon for branches which lie near the ground, where they are well protected, to retain their verdure unimpaired through the winter. In setting the hedge to which we refer, Capt. Bacon used alternately a plant of the privet and one of the buckthorn. But, notwithstanding the vigorous and hardy character of the buckthorn, the privet now prevails; and at the time of the visit of your committee, (the 16th of October,) very little of the foliage of the buckthorn was visible, but the leaves of the privet clothed the whole surface with a soft, delicate green. The hedge, which is extensive, is five years old.

The plants of the privet may be obtained at very little expense from England, or may be raised from the seed, or from slips—the better method of the two. The only objection of which we are aware to the use of this material for hedges is, that, in certain positions, the plant, though in the main very hardy, is, from some cause, subject to occasional blight or injury. It thrives in almost any soil; but dry, hot situations are least friendly to its healthy growth and vigor.

Very fine specimens of buckthorn hedges may be seen in

Dedham and elsewhere in the county; but to give a detailed notice of them would be impossible within the limits prescribed for this report. The attention of your committee has been directed particularly to hedges of the arbor vitæ, which possess some very decided advantages over all others. They are beautiful through the year. In winter, it is true, they lose their decidedly green color and assume a slightly brownish tint. But still they are beautiful; while the buckthorn, with the loss of its foliage, loses its whole beauty. There are few objects in ornamental grounds on which the eye lingers with more pleasure than on the thick, massive, and seemingly impenetrable foliage of a well-cut arbor vitæ hedge.

It is an advantage attending this material, too, that the plants can be readily trained to any height almost one chooses, from that of the common hedge to fifteen or twenty feet or more, when a screen of that height is needed to conceal objects unsightly to the eye. Careful and proper clipping, however, is necessary, whether the plants stand alone, or are grouped in clusters, or arranged in the line of a hedge, else the branches will grow straggling and lose a great part of their beauty.

A hedge of arbor vitæ is, of course, subject to injury from cattle, which must be carefully kept from it. From its delicacy and susceptibility to injury, too, it does not answer well on the roadside, where passers by are liable thoughtlessly to pluck branches from it—thus making holes, or giving it a ragged appearance, from which it may be some years in recovering.

There is no particular difficulty in rearing an arbor vitæ hedge if it can be secured against depredation from the horns of cattle and from human hands. The tree is very tenacious of life, and the expense of setting and rearing the hedge is very little greater than is required to rear one of other materials, the buckthorn or prim, for example. It was formerly thought that the plants, which may be obtained in abundance from the forests of New Hampshire and Maine, must be transferred from the forest to the nursery before being used for a hedge. But experience shows that, if taken up and packed with due care, this is unnecessary. Hedges formed from plants brought directly from the forest will succeed very well with proper treatment.

Capt. Bacon has a large extent of arbor vitæ hedge reared from plants, brought, we believe, directly from the forest six years ago. It borders on an avenue, from which it is separated by a bank wall, which secures it against depredation or injury; and on approaching the residence of the proprietor, it forms a very attractive object to the eye. Capt. Bacon has, in all, one thousand nine hundred and forty-nine feet of hedge.

To the beauty of Mr. Shaw's hedge of arbor vitæ, all who have seen it will bear testimony. It was begun five years ago, the plants being taken from a nursery; and nothing could be more successful. It stands on the edge of a beautiful lawn which spreads before his house, and is graceful in its form, presenting easy curves, on which the eye dwells with peculiar satisfaction. Mr. Shaw's hedge, in a continuous line, consisting of arbor vitæ and buckthorn, is one thousand one hundred feet; besides which he has another piece of arbor vitæ hedges of some length.

EBEN WIGHT, *Chairman.*

DEDHAM, November 16, 1854.

DEEP TILLAGE.

A Prize Essay, from the Transactions of the Essex Society.

BY DR. E. G. KELLEY.

Deep tillage is the *sine qua non* for immediate and permanent success in horticulture, agriculture, and particularly arboriculture. Under this head we include all deep working of the earth, such as trenching, and trench-spading, draining, deep ploughing, and subsoil ploughing; to be followed by deep tree and seed planting.

The principle we are about to advocate in the preparation of the soil is not entirely new. The farmer who is proverbially prejudiced against any innovation on his long-established customs will bear in mind that our first progenitor was expelled from the garden to "till the ground." While this word "till" may be applied to general husbandry, it is susceptible in the Hebrew, as we learn from good authority, of a more special and profound signification, equivalent to deep culture, digging, labor, producing the "sweat of the face," as we often see in trenching.

Judging from the recorded characters of this first farmer, and his oldest son, who was also bred a farmer, we may infer that they refused to till as commanded, and consequently gathered a meagre harvest. Hence, at the first agricultural exhibition, when the latter presented the "fruits of the ground," these did not even command "respect." Nor has the occupation itself been respectable since in the minds of many. Thus disappointed and mortified, the son at once, like most of the sons of farmers, turned his attention to city life; and, as is too often the case, he did not appreciate the worthy daughters around him, but married his wife in a foreign land, and even named his first born after his favorite city. If, therefore, the agriculturist would gain the respect and approval of man and his Maker, please his wife with tempting fruits, keep his sons at home, and marry his daughters, he must raise, decidedly, his standard of excellence, of cultivation, and of refinement.

This first attempt to extend garden culture to the field failed; nor has it obtained to the present time to any great extent. The modern horticulturist gives to his vines and choice trees that thorough culture which every product of the earth requires for its most bountiful yield. His few rods, well drained and trenched, are more profitable than as many acres of the farmer's unprepared land. Another class, as yet quite too limited, can count their varieties of pears and apples by hundreds, all under high keeping. Their taste and refinement are apparent by the order, neatness, and thrift of every thing about their beautiful mansions, ornamental grounds, and gardens, as well as their extensive fields and herds. We cannot refrain from calling these the hortico-agriculturists of the country, connecting links between the two extremes, to whom the mere routine agriculturist may well look for pecuniary, ornamental, and scientific improvement in his department.

To many farmers, mulching and irrigation are mysterious words. But for the drought only are these serviceable, and for this, even, they are not adapted to general use. Our theme, on the contrary, is universal in its application, equally serviceable for every vicissitude of weather and season, for all localities and varieties of soil, and for every vegetable production. It is a term familiar to all, if not in its qualification and details.

It turns the drought itself to good account, and renders mulching and irrigation comparatively useless, or, if used, more efficacious. During a dry spell and in trenched ground, roots strike deeper in search of food and moisture, become more extensively ramified, and sooner find the rich loam and manure intermingled deeply with the soil. The leaching process, as it is called, is reversed, and takes place upwards more than at any other time, or, in more scientific phrase, capillary attraction is increased. As each particle of moisture is evaporated from the surface it is succeeded by another, and the whole soil is filled with the ascending moisture and gases, which are appropriated by the numerous rootlets as they have need.

The wet season is also a blessing to the deep cultivator. The more rain, the more heat, ammonia, carbonic acid, and other organic elements are left in the soil as it descends. As each drop filters through, it is succeeded by another, or by air, both essential to vegetation, and to dissolve, act on, or combine with, the inorganic elements of the soil. As the water drains off air is sure to follow; and this is the proper mode of its circulation. Each is also generally at a higher temperature than the undrained land, and the warmth of the under soil is therefore relatively increased. The farmer often objects to this waste of water, and would fain retain it for a dry time. The trenched and porous soil holds water like a sponge, notwithstanding the drainage. It retains or can command enough for the wants of vegetation. But let us see the operation on the undrained land.

The farmer often speaks of his "cold, wet land." No variety of soil, in any location, is, of itself, colder than another. The very water which trenching, draining, &c., allow to pass off after imparting its virtues to the soil, if retained on or near the surface by hard, impervious subsoil, becomes itself, by its changes, the source of the coldness complained of. Instead of running off it evaporates, and by this process abstracts a great quantity of heat from the soil and surrounding atmosphere. The evaporation of a pound of water requires about one thousand degrees of heat,—some authors stating it less and others more,—or it reduces one hundred pounds of air forty-five degrees. This is reversing the experiment of Professor Johnson, in Espy's "Book of Storms," where he says "a pound of vapor" condensed to water "would heat one hundred pounds of air about forty-five degrees." The ground to a considerable depth is warmer, by many degrees, where the rain is drained off instead of being allowed to accumulate and evaporate. Hence this enormous loss of an invaluable stimulus to vegetation.

This chilling and deadly process of evaporation is going on to excess from the time frost comes out of the ground in the spring till freezing again occurs. At this period the undrained land, having the most water to freeze, becomes the warmest, say in December, when of no value to vegetation, but rather an injury. For once, forsooth, the undrained land is warmer than the drained. But for this excess of heat in winter, this kind of land must pay dearly in early spring. "How is all this?" inquires the farmer. Simply because water in congealing to either ice or snow has its capacity for heat lessened about one-ninth, and this excess is given off to surrounding bodies; or, in other words, its latent heat is set free. On the other hand, ice, or frost as it is called in the ground, in melting, demands back this same heat, at the rate of from one-eighth to one-ninth of one thousand degrees for every pound melted; and under the surface it does not obtain all this directly from the sun, but through the soil. Therefore the more water, the colder and longer cold will be the land in the spring. Now, let the agriculturist go to work and make this "cold, wet, heavy land" of his the very best he has for any product—trees, vegetables, grains, or grasses. Expense is his next objection. To this we will allude in passing.

Trenching.—This is understood to be simply inverting the ground to a given depth, without change of material or place, except for the mere facility of the operation. We generally make the trenches three feet wide, and from two to three feet deep, never less than two. The bottom of each, after being thoroughly loosened with spade or pick, should receive the small stones, brush, horn piths, or any rubbish at hand, and then the sod or surface soil of the next section should be shovelled over. It may be necessary to vary the depth according to the condition of the subsoil. If hard strata of sandy or clayey loam are met with, they should be broken up for the free transmission of water. In decidedly clay bottoms through which water will not pass, we construct drains a foot below the grade of the trenches, and twenty-five feet apart, and, if the inclination of the land will admit of it, at right angles with the latter. After a trench is finished, these bits of drains are sunk, corresponding with those of the preceding trench.

A man will trench about two square rods in a day, which, at a dollar per day, amounts to eighty dollars an acre. But many laborers are hired by the year, say at an average of thirteen dollars per month, or at the rate of fifty cents per day, including board, thus lessening the expense about one-half. It may also be done early in spring or late in the fall, when other work is not pressing, or at any intermediate leisure time. This may be thought too expensive for common farming crops, where other means and modes can be extensively employed; but it is indispensable for all garden purposes, for ornamental grounds, and for trees of all kinds; once done, it is done for a lifetime. To us the expense is balanced by the gratification in doing it, and in witnessing the subsequent increased growth and produce of every thing cultivated. With what satisfaction do we see "dog grass" plunged to the bottom of a trench, never again to rise, along with the seeds of innumerable weeds, accumulated by years of neglected cultivation, nevermore to vegetate! In fact, we think the time saved by thus obviating the necessity of destroying weeds on many pieces of land would, in half a dozen years, equal the time spent in trenching; the soil in the former case not being permanently improved, while the value of the trenched increases annually.

As the operation progresses, all the manure that can be spared may be mixed with the soil or carted upon the new surface after the ground is frozen. We also spread on lime or ashes to neutralize any acids that may be in the yellow virgin soil, already richer to us than if colored by the golden sands of California. We are aware that many look upon this yellow loam as being positively noxious, which we so much delight to see upon the surface, to be enriched by the rains and snows of summer and winter, and pulverized by the freezing and thawing of spring and fall, while the roots of our trees, strawberries, and roses are revelling in the rich loam beneath.

Trench Soiling.—We have presumed to coin a new term for the process of deepening the soil while trenching. It might more properly be called subsoiling if this were not already used synonymously with subsoil ploughing. When the under soil is not capable of being made productive it should be removed, and turf, loam, muck, manure, or compost substituted. We have often been surprised at the variety of subsoil in nearly the same location, not always indicated by the super-soil. Gravel, stones, sand, or clay are not unfrequently a foot or less below the surface. In trenching two acres we obtained an abundance of the former for all our walks, and small stones to drain an acre of wet land, and filled their places with better material. Portions with clay and sandy subsoil were trenched both at the same time, and loads of each exchanged and mixed —making some of our best land.

This made soil is still more expensive than the merely trenched; but land that is comparatively worthless is thus rendered valuable. Land on which no dependence can be placed for a crop in dry or wet seasons may be made the most productive, and permanent success secured. Many trees which flourish through a series of ordinary years die during the first severe drought, as has been the case the past season. Let, then, the cultivator make his soil of uniform quality and depth, and be no longer liable to vexation, or doomed to disappointment.

While land is being trenched or re-soiled, as above, it is a convenient time to level or grade—and this has not been one of the least of our objects. Any superfluous yellow loam spread on grass land, or sand or gravel on clay land, will well pay for the carting. The agriculturist has many opportunities for improvement. While much of his work is laborious, he is not usually as active and industrious as men engaged in other business. Our early youth was spent on a farm, and we are now returning to our first love. Men of all pursuits and professions seldom find a resting-place, mentally or physically, till they own more or less of *terra firma;* and we envy not the person who does not enjoy improving and embellishing it.

Trench Spading.—The cultivator who makes no other extra, and, to him, useless outlay, will find his reward with many garden crops in what may be called double or trench spading. We do it thus: Spade a cut in the usual way; then step into the excavation at one end and work backwards, spading of course at the bottom of the first cut, throwing the earth on top of that first turned up, or leaving it in the trench. We prefer the former; for, as the reader is already aware, we like some poor soil at the surface. The next regular cut will then fall at the bottom of this spaded trench. Twice the time is required to spade in this manner, but double the crop will follow in a dry season. Corn planted the past year on land so prepared, and previously well manured, showed no signs of the excessive drought, while our neighbor's crop was almost worthless. We might add, however, that this same land was subsoil ploughed two years before.

Draining.—For wet, clayey, and extensive fields, intended for grass or annual crops, under-ground draining and one thorough subsoil ploughing will be found the proper treatment, and somewhat less expensive than trenching. We have had experience in less than two acres, drained with brush from the orchard and stones accumulated in trenching, and are getting quite in love with the operation. We have five acres of clayey land not yielding a ton of hay to the acre, but are bound to have at least treble the quantity. There are two ways for the farmer to calculate expense—that of doing, and the virtual loss by not doing. A few years' profits would have paid for draining this whole field; but want of time and tiles have delayed it.

Drain tiles cannot, at present, be procured nearer than Albany, but will soon be manufactured in this State, when we trust our New England agriculturists will use them extensively. There is ample evidence of their utility in England and in New York. We dig the drains three and a half feet deep and twenty-five feet apart. Owing to the dry season the clay bottom became unusually hard, and, wages being high, we paid thirty cents a rod; but they can be made for less under more favorable circumstances.

Deep Ploughing.—This is the first step taken by farmers in the course of innovation on their superficial culture. Many, however, are still inveterately opposed to even this; but we hope they will plough a few inches deeper every year, as has been often modestly recommended. Before either the subsoil or Michigan plough was heard of, we used to have our garden ploughed twice in the same furrow, and with great advantage. For this operation, very unreasonable to the man of the plough, we had to pay more than doubly dear, and might not have escaped mobbing had a dozen like fellows been at hand.

The Michigan, or double, plough is indeed a timely invention. Its work is imperfect trenching. On land that would be improved by draining, but neglected, the turning of the sod into the bottom of the furrow, and bringing up the under soil, is better than subsoil ploughing. The surface is left in fine tilth for one ploughing, and the drainage effected by the greensward beneath keeps it so; and almost any crop will tell of its good effects during the summer. But this is temporary. Deeper and more permanent results will be effected by subsoil ploughing.

Subsoil Ploughing.—This is ploughing through and loosening the substrata without bringing to the surface any of the farmer's obnoxious "cold soil." It is not recommended on wet land previous to draining by those who have had experience, but afterwards its effects are said to be very marked. We have subsoil-ploughed, to an average depth of twenty-two inches, half an acre, with a hard, gravelly subsoil, intended chiefly for a lawn. This land we cultivated with vegetables one year prior, and two years since, with the addition of trees. The comparative thrift of the former after the operation, and the luxuriant growth of the latter during the summer droughts, were remarkable. Some of the pear shoots measured from five to six feet. It is on these not very unusual occasions of drought that the importance of deep tillage in any form becomes most apparent. But for no product of the earth is it more so than in tree culture.

Tree Culture.—In this, deep tillage is of paramount importance, and the time to do it is before any trees are transplanted. We are draining between the rows of an old orchard, on very tenacious soil—the only sub-treatment that can now be given without too much injury to the roots. To "dig round and dung" these trees has been as fruitless as in the case of the ancient fig tree, which was doubtless on untrenched soil! Haste to get trees into the ground, to remain stinted for years, and never after to thrive and produce as they would on properly-prepared land, is too often followed by regrets to the present and subsequent owners and the early decay of the trees.

Our plan has been, to be four years preparing and planting four acres. We allow the land trenched in one season to settle till spring; then, after levelling and manuring, if needed, when not previously done, set out the trees. If all was imperfectly done in one year, a great source of enjoyment would be lost. Next to the gratification in observing the vigorous growth of one year's labor is that of preparing for the next plantation. Employment, useful and with an object, is essential to our happiness.

Just now the universal caution is, not to plant deep. Why? Not because deep planting is not necessary in point of fact, but for the reason that so many trees are buried in mere graves, to die afterwards by stifling, thirst, and starvation. Where is the tree or shrub, cereal or vegetable, that does not take deep root if it can, and can find food there?—yea, in preference to superficial growing. Was there ever an old drain or vault not permeated or filled with the roots of trees standing in the vicinity? We have found them eight feet from the surface. Who has not noticed the rank growth of trees, briers, and weeds by the railroad side? Rich loam and vegetable mould do not abound there—mulching and manures are not applied. What then is the cause but deep stirring and mingling of the earth, its comparative light and porous condition, through which the rains of heaven filter freely, imparting her special manures as they descend, and descend but to return by the slow process of capillary attraction, and by the very rootlets which feed upon them?

We have transplanted successfully hundreds of one of the most superficial growers of the forest, the hemlock spruce, (*Abies canadensis*,) setting them three inches or more deeper than we found them, or sufficiently so as to smother the grass taken up with the trees. The common laurel, (*Kalmia latifolia*,) with which most people fail of success, has succeeded entirely planted in trenched ground. These were taken from very poor, sandy soil, where the roots ran near the surface, and planted three inches deeper.

The farmer may boast of his natural soil, wet or shallow, and trifle with the idea of an artificial one, or the benefits of science. The sage nursery-man may direct to plant the tree only as deep as natural, and in similar soil, heedless of the fact that cultivation gives a second nature. With this word *nature*, however, and its advocates, we have but little sympathy. What was ever more fortuitous than the formation of soil on the face of the earth, or the lodgment of seeds of the vegetable kingdom? Cultivation is artificial; and the more art directed by science, the greater the success. The progressive cultivator is not to inquire what Nature does without the means to do with, but what can, or rather what cannot, art accomplish with the help of science, vegetable physiology, observation, and practical experience. We have taken great pains to obtain peaty soil for rhododendrons and other shrubs for which peat has been recommended; but all grow equally well planted deep in trenched garden soil. We are therefore not an advocate for special soils so much as for special tillage and manures.

The constitution and habits of all kinds of vegetation are not very dissimilar. Why, then, should celery alone among vegetables be cultivated in rich soil, trenched from two to three feet deep, and its roots half that depth below the surface for a long time, not only with impunity, but with the most thrifty growth? This is done ostensibly for bleaching; but who can fail to see the manifest good from its deep culture? What is this vegetable by nature, or in its natural soil? Why should the pear, and that only on the quince, be planted so deep as to throw out roots from its own stock, and for that purpose merely? Is any tree more thrifty than this, thus planted in rich, trenched soil? What is the native by the side of the improved or cultivated pear? And what may not deep terra culture yet accomplish?

The tap root of a tree is cut off in the nurseries or destroyed when taken up elsewhere; then why may not the remaining roots be set deeper as a substitute for the loss? And if the other roots are thrown out, what is the harm? Indeed, why has it a tap root at all, if deep rooting is not necessary? Our practice, however, is, to plant so deep that the existing roots shall throw out laterals in all directions, but not to require them from the collar of the tree. We never lost a tree by deep planting. Some are thereby later putting out in the spring; and we have adopted a plan in some instances of not bringing all the earth around the tree till after the leaves have started, and even much later, when it answers well for mulching. Planted in this manner, we have yet to learn whether the late growth of wood will not ripen to withstand the winter.

Let us be understood as advocating deep planting only when the soil has been properly prepared. We would sooner place a tree on the surface of the ground and heap dirt around it than thrust it in a hole barely large and deep enough to receive its roots. We can conceive of no more certain way to destroy a tree than this exposure to half a dozen mortal causes. A tree set in such a basin, with a hard stratum beneath, is liable to be drowned; the water excludes the air, and the tree is stifled. Even if good loam is put around the roots for early use, when they are obliged to extend laterally into soil unfitted for them the tree starves. When a drought occurs, the hard ground at the circumference of the roots becomes dry first at the very point where there should be the most moisture and nourishment, and the tree is "withered, dried up from the roots." Should it survive all these, the water freezing about the roots may throw it from its position, or long-continued stagnant water will end its days sooner or later.

The amateur cultivator occasionally loses some of his trees in winter, both fruit and ornamental, and forthwith declares such species or varieties not hardy. We doubt not many rare and valuable trees and shrubs, deciduous and evergreen, not now supposed to be sufficiently hardy to endure our climate, or only half hardy, will be found, by repeated trials in thoroughly drained soil, to be perfectly hardy. We have some proofs of this; but present limits will not admit of details.

Deep Seed Culture.—We can only allude briefly to seed planting. Often is the farmer obliged to wait till late in the spring to plough much of his land. His seed is planted, and rots, or a few parching days prevent its vegetating. He knows not which most to fear or guard against—a sudden wet or dry spell. This uncertainty, and perhaps loss of crops, are obviated by some of the modes of treatment we have recommended. Seeds always should be, and then can be, planted deeper than is common. They will vegetate sooner, more uniformly, and be followed by a more luxuriant growth.

Land well drained may also be cultivated much earlier, and it is often quite an object to give some crops an early start. If the tops are cut down by untimely frosts, life will not be as often destroyed if deeply planted, as is the case with Indian corn. Short and stocky stems above ground are also better able to withstand the changes of wind and weather. It is not unusual for grains and grasses to be winter-killed. If, however, the agriculturist will have the roots well covered by a deep gauge of the seed sower, and well drained, he will not be likely to lose his summer prospects in winter.

Another consideration is the hilling process. It will still be found unavoidable to hill in the old-fashioned way if the plough runs but a few inches deep. Corn must have dry soil and deep root; and if the farmer will not work *down*, he must work *up*. No practice, however, is more absurd and useless than this, if abundance of room and ample drainage are provided. Writers may discuss the *pros* and *cons* of its expediency; but we believe it will be found to turn, finally, on this point of deep tillage.

PLOUGHING.

WORCESTER.

Report of the Committee.

Your committee claim to be veterans in the ancient and honorable occupation of ploughing—a large majority having seen much field service, either as holder or driver, and frequently serving in both capacities at the same time; and some of us claim the honor, pleasure, and profit of participating annually, either as ploughmen or drivers, or of being chained to the post, for a whole generation (of thirty years;) and they well recollect the old wooden plough that was used here thirty-five years ago at the society's first exhibition. It was then ride and tie; you ride, then I. Each owner of oxen had the privilege of hitching his team to this one plough, and with a driver, and a strong man to hold, bracing himself at an angle of forty-five degrees. And the cry from the wondering spectators, as well as marshals, was,—

> Clear the brown path, to meet his colter's gleam;
> Lo! on he comes, behind his smoking team;
> With toil's bright dewdrops on his sunburnt brow,
> The lord of earth, the hero of the plough.

A generation has passed. We have ploughed in thirty-five different fields, and on many of them now stand some of the most costly dwellings to be found. And it is believed by your committee that if at any time the good old Commonwealth should find fault with the part of the bounty she has so liberally bestowed on us for the promotion of this object, we could easily show her that she, in turn, had been richly remunerated for paying our tuition; for, wherever we have ploughed, good crops have been sure to follow: first milk, then meat, then *men*, not a few, nor of ordinary quality—three at least who have most honorably and wisely administered her government nearly or quite half of the years we have been ploughing. Besides, our land has produced a larger crop of house and city lots than can be found in any other agricultural society to which she has extended her bounty. We have ploughed the good old village of 1818 into the city of '54, and turned the wooden instrument of that date into the beautiful and useful one of to-day; and, in turn, the city has turned us and our cattle pens from our first love (the common) into the barn yard belonging to the new farm; but, they having kindly permitted us to take our flocks and fatlings with us, we will not complain.

This morning your committee, encouraged by the past, started sixteen well-fed, well-trained strong teams. Fourteen ox and three horse teams had been previously entered for the trial. Sixteen promptly made their appearance. One of the delinquents came forward seasonably and stated that one of his oxen had been lamed, and it was impossible for him to fulfil his engagement. All the teamsters displayed a remarkable degree of skill. No noise, no whipping, was heard. Every ox and horse seemed to understand the arduous duties imposed on him; and to say that the skill and dexterity of the ploughmen were in the least behind any former year, would be doing injustice to their real merit.

The field on which the trial was had to-day was a favorable one. The soil for the first five or six inches is a gravelly loam, with a clayey, loamy subsoil, and of about the same character as a large majority of our Worcester county hill lands, and should, in the judgment of your committee, be worked to a much greater depth than any single team is able to plough. And your committee would recommend that, in coming years, a portion at least of your premiums be offered to any team suitable to turn the furrow from eight to ten inches deep, whether with the Michigan, subsoil, or other plough, rather than as heretofore offered only for single teams, which are never able to plough deeper than from five to seven inches, and this for no length of time. Your committee all agree that the day has passed when we should encourage shallow ploughing, certainly of such soil as was ploughed to-day. If Mother Earth yielded her productions spontaneously to the inhabitants of the garden of Eden, she is not so indulgent now; for she must be continually stirred and vexed by the plough, and more deeply and thoroughly tilled and cultivated, or her children will want. And your committee know of no instrument in use that equals the Michigan plough for thorough cultivation and pulverizing the soil, as well as to leave it in the best possible condition for any crop which may follow.

We do not propose going into details as to whether this plough requires more strength of team to turn the turf eight or ten inches under and bring four inches of the subsoil to the surface which had never been disturbed before; but reason, and the experience of to-day, have convinced us that it requires (certainly for the first deep ploughing) nearly three times the strength of team, with any plough, to go ten inches in a clayey soil than it does to turn six inches.

Our old friend Major Newton kindly furnished us with a team of three good strong yoke of oxen; and after the other (single) teams had finished their respective lots, this team of three yoke was hitched to the Michigan plough, and we witnessed with great pleasure a few rounds at the depth of ten inches full—completely turning under every particle of grass, and bringing up a portion of the subsoil to the surface, where, if allowed to remain fallow a short time, it becomes as strong and good as new. There has been a theory in times past, and a very plausible theory it was, that the goodness of manures would be lost by deep ploughing, or rendered unavailable, as they must necessarily leach or filter away through the substratum. Let any one who fears this calamity take turbid or impure water of any kind and filtrate it through a common filterer, or, in absence of this, a common flower pot, with a hole in the bottom. Let him first put in his surface soil and apply his turbid water, and he will soon discover that this worn-out soil has not the power to deprive this barn-yard liquor or other water of its color or odor, only in part; but if you fill the filterer with the subsoil and run this liquor through, you find it comes out robbed of its odor if not entirely of its color. Hence the use of subsoil on all clayey lands, for the compost heap as well as barn yards and pigsties, in preference to the surface. We cannot close this report without urging our farmers to try deep ploughing in almost any of our Worcester county soils—certainly such as we have been ploughing to-day. This cannot be too strongly urged if we would increase, by a large percentage, the amount of our crops.

HARVEY DODGE, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of Horace Kellogg, Jr.

No. 1 was a piece of gravelly land sown to spring wheat, about half an acre subsoiled to the depth of fifteen inches. I sowed about an acre without subsoiling, which ripened prematurely, on account of the drought, so as to be hardly worth cutting; while that on the subsoiled part was as fine wheat as I ever saw.

No. 2. I planted ten acres of Indian corn—the soil a heavy loam, ploughed to the depth of eight inches with the Michigan plough. Subsoiled four acres of it to the depth of eighteen inches. The corn on the subsoiled part evidently stood the severe dry weather better than that on the land not subsoiled, though I have not determined the difference by measurement. I subsoiled a piece of heavy, wet loam for potatoes; but as it was not sufficiently drained, it was an injury to the land. I think, from my experience, it will not do to subsoil wet land without first draining it sufficiently deep to carry off all the water.

AMHERST, October, 1854.

HAMPSHIRE.

Report of the Committee.

The preparation of the soil with the plough, an important preliminary to the reception of seed, is, every thing considered, the groundwork of farming. It lies at the bottom of the whole subject, and is its grand basis. As we enter upon this theme, a multitude of inquiries suggest themselves.

To a few of the most important we will give our attention. Many things are positively necessary in order to have the work done properly and well. First, the quality and condition of the soil are to be considered. If not already in a fit state, the work of preparation should be thoroughly consummated. Heaps of stones, rocks, and roots of trees and shrubs, and every other impediment should be removed. The soil should be neither too wet nor too dry. A suitable moisture is highly necessary to a smoothly-turned furrow, and the work is done with much greater ease. A day or two following a moderate rain is a suitable period for ploughing, more particularly on sward land. Secondly, the plough must be of the right kind, and constructed on scientific principles. No man, however skilful, can do the work well with a poor plough. And there is no good excuse for using poor ploughs at the present day. American ingenuity has brought the implement so nearly to perfection that few more improvements can be made; and the prices are low enough, so that every farmer, however moderate his circumstances, can own the very best. We have a great many excellent varieties. There are so many that do the work very perfectly that farmers can select without much hesitation.

The different varieties have their peculiar excellences. Some are more suitable for stony, others for sandy, land. Some do the work best in light, others in heavy, soils. Another is suitable for one section of country, while a different style and size are just the thing, where the first would do badly. All latitudes, lands, and tastes can be suited and well served; and the ploughman, if he possesses a proper judgment, can easily adapt his implement to the condition of his land.

Thirdly, a proper and well-trained team is an important item in good ploughing. One that will go over the most ground with a good deal of *hawing*, and *geeing*, and *goading*, is by no means the best team. More land may be badly ploughed, to be sure, by "cutting and covering," and leaving the work half done; but what are the results? The team, at night, will be jaded; the ploughman hoarse and full of vexation by hallooing to his team, and lame in every joint; and, worse than all, the ploughed field will appear more like the "sea in a storm" than a lot of well-turned furrows, and will be withal ill prepared for future use. One acre of sward land is enough for two yoke of oxen to plough in a day. They should be trained to work evenly and without fretting. They should be of the right age, condition, and strength to draw the plough steadily along the furrow. They should be well fed, kindly treated, and have a suitable driver.

The ploughman often drives himself, when ploughing with a single, well-trained yoke of oxen; but when more than one yoke is required, a driver is necessary. Boys are sometimes employed, restless, peevish, and ill tempered, and entirely unfit for the business, not having half the discretion of the oxen themselves.

They can shout *haw!* and *gee-up!* and flourish the whip and use the goad to perfection. The well-trained and sensible animals, not used to such company, fret and miss the furrow as the lash is inaptly and untimely applied; and, as a consequence, the land is badly ploughed, and the animals injured. The lash and the goad to the backs of such boys, say we, and a good discretionary driver for the oxen.

Finally, it requires an experienced and skilful ploughman in order that the work be well and properly done. It actually does require tact and experience to guide the plough handsomely and to turn a furrow cleverly. Other things being equal, a *fresh* and a *green* hand and an old, well-trained ploughman will produce very different results.

Width of furrow, depth, completeness in turning the sod, proportionate width and evenness of all the furrows,—all these receive the attention of the experienced ploughman; and when his labors are finished he beholds his field with honest pride, a beautiful triumph of the plough and the laborer's skill.

The above requirements are positively necessary and essential to a well-ploughed field. There are other collateral circumstances and things of minor consequence that ought to receive attention. The plough should be kept in good order, and free from soil, rust, and corrosion. A rough, unsmooth plough turns a furrow badly, and requires more power to operate it. Ploughs should be kept housed, well cleaned, and polished, and then they will be fit for use.

They should always be supplied with a proper point. Some farmers use a plough until the point is worn out and as blunted as a miser's conscience, and it is impossible for them to do work even moderately well. This is poor economy, and smacks of bad calculation and want of judgment. Fifty cents for a new point, as often as the old one ceases to do well, is money well applied.

DAVID RICE, *Chairman.*

HOUSATONIC.

Report of the Committee.

The ploughboys of southern Berkshire are not to be beaten. They cannot well beat each other. Direct them to cut a furrow slice of precise width and depth, to lay it flat or oblique, and the direction will be obeyed to a hair. They are experts at the plough in the full sense of the term. With such facts to act upon, how can a committee discriminate? When all stand upon equal footing, instead of making solemn award in respect to distinction of merit, the attempt to do which must necessarily be greatly perplexing, the juster and readier way would be to permit the competitors to "draw cuts."

Forced, however, as the committee were to make discrimination, they have distributed the premiums, in their judgment, as properly as the difficult service would allow.

Our ploughing match, always interesting and exciting, occurred this year under most happy auspices. The day was beautiful. A great concourse of "our good people" attended to witness the struggle. There was a sufficient number of competitors to render the scene animating; capital order was maintained. Inside the lists was witnessed the glorious tug for victory; outside was the applauding multitude, ready to give the "all hail" to each ploughman as he turned over the last inch of his furrow. Away with

> "The glory earned in deadly fray!"

and give us forever the glory of the plough.

Not the least gratifying passage in the proceedings of the day was the fact that the ploughing match was had upon our own ground, purchased by the society—a fact worthy to be noticed, as indicating the prosperity of the society.

The number of competitors was twenty-two—fourteen with horse teams, and eight with ox teams. Land ploughed by each team, one-eighth of an acre. Time allowed, without rest, thirty-five minutes.

I. Sumner, *Chairman.*

SPADING.

ESSEX.

Report of the Committee.

Thirteen entries were made, but only seven men competed for premiums, all of whom were Irishmen.

The ground selected was a soft loam, and, though somewhat uneven, well adapted for digging, but rather too narrow to accommodate the numerous spectators who crowded with great interest to witness, for the first time in this county, a competition of strength and skill in this direction. Towards the close the excitement increased to confusion, as the better half of one of the competitors stepped forward and fanned him with her shawl, as in a burning sun he strained every nerve to win one of your liberal premiums.

Each of the lots contained sixty square feet, and the work was performed in from eight to twelve and a quarter minutes. Two of the lots, Nos. five and seven, were dug with shovels; but as this was the first effort of the kind, and the men understood that it was immaterial whether spades or shovels were used, they were allowed to compete with the others.

Some of the men dug with a *trench*, laying aside the first row of sods, with which they filled the trench at the close. Those who did so, appeared to find less difficulty in covering the sward than did the others, who placed each sod in the spot from which it was taken. All the lots were dug too rapidly to admit of much pulverization, though some were left in better condition than others.

Towards the close, in consequence of the spectators crowding close upon the work, the committee found it difficult to observe so accurately as they wished, the manner in which the work was performed.

MANURES.

WORCESTER NORTH.

Statement of Joseph Upton, Jr.

Wishing last spring to try an experiment to test the value of guano compared with compost manure from my barn cellar, I manured one acre of land in the following manner: on two-thirds of the acre I spread twenty common ox-cart loads of compost manure from my barn cellar, and ploughed it in. On the other one-third I sowed two hundred pounds of guano, broadcast, and harrowed it in. I then planted the whole acre with corn, putting a small handful of plaster and ashes into each hill, and cultivating the whole alike. On the 10th day of October the committee on grain examined that acre; and, in their judgment, there was but very little difference in the corn on the two parts. They selected one square rod, the ears on which weighed fifty and one-half pounds, and they gave me the second premium. As near as I can calculate, the expense per acre, manured as the above two-thirds were, would be about forty dollars, and the cost per acre, manured as the one-third was, with guano, about twenty-five dollars, showing a difference of fifteen dollars per acre in the expense in favor of the guano.

HAMPSHIRE.

Essay by L. Wetherell.

Of all the numerous topics that concern the tillers of the soil—those who have entered into partnership with Nature in order to multiply and increase the products of the earth upon which man and his various domestic animals are to subsist—there is none, perhaps, that more intimately relates to their prosperity and ultimate success as farmers and gardeners than that which the executive committee of the Hampshire Agricultural Society proposed in their last annual showbill for an essay, to wit, "Compost Manures."

Homer, who lived many hundred years before the Christian era, mentions an old king who was found manuring his fields with his own hands. Whether this circumstance gave application of the word manure, from *manus*, signifying the hand, does not belong to the essayist to determine; neither is it of any consequence in the present discussion, because every farmer as well understands the meaning of the word as now popularly used by writers and speakers, as he would were the question of its etymological derivation settled beyond a query by the most learned English or German philologist.

Compost, in agriculture, is a mixture or composition of various manurial substances for fertilizing land. Compost manure may therefore consist, as it often does, of a mixture of vegetable and animal substances with lime or other earthy matter, substances, or compounds.

Before proceeding to the discussion of the subject under consideration, it may be well to review, briefly, its past history, in order that all who feel interested may be able to mark the progress made through a long series of ages.

We read concerning Adam, the progenitor of the human race, that after he was created, even before his lovely and loving consort was provided for him, the Lord God planted a garden in Eden, and there put he man, whom he had created, to dress and keep it—thus implying that a life of innocence, even, was not a life of indolence nor idleness, but a life of activity. Eden's garden was to Adam a place of pleasure and delight, and yielded at first, no doubt, spontaneously, the cereals and fruits upon which man subsisted. This early account of the first man would seem clearly to demonstrate that his first employment was horticulture—a vocation than which none, even now, can be found more consonant with man's purity and innocence. In what place even now, in man's degeneracy, does he find more exquisite pleasure and delight than in a well-dressed and well-kept garden of beautiful flowers and delicious fruits? In order, therefore, to enjoy this paradisiacal delight and pleasure, designed for man by his Creator, it is necessary that he should know how not only to dress and keep the "planted garden," but how, also, to restore and replenish its exhausted condition, caused by a successive cropping of fruits, and grains, and pulse. No virgin soil, however richly stored with the elements of plants, can long be annually cropped without becoming sterile and unproductive. Hence it is fair to infer that to dress and to keep the first garden signified more than spading, or ploughing, and cropping. As man multiplied upon, and replenished the earth, he would come to see, as the process of soil exhaustion was going on from year to year, as he observed the diminution of his harvest from season to season, that some mode of re-fertilization must be resorted to, or else he must frequently emigrate, and thus carry forward the sure work of impoverishing desolation until every fruitful field should be converted into a desert waste.

Man, being both an observing and reflecting creature, would most certainly come to a knowledge of manurial specifics such as would, if rightly applied, restore, and even improve, the original state of his garden or farm. Thus from history may this process be demonstrated. But in the course of time, when the maximum of improvement in cultivating the soil should be attained, as in Egypt, the work of emigration would be as sure to go on as under the exhaustive and minimum process.

Very little can be found concerning the modes of cultivating and fertilizing the field and garden until the dawn of Grecian history. It is said of Augeas that he was first among the Greeks to discover the use of manure. If so, it was probably subsequent to the time when he stipulated with Hercules to clean out his stable in one day,—though it had not been done for thirty years, notwithstanding he is reputed to have kept three thousand oxen,—promising, if he would do so, to give him one-tenth of his cattle. This Hercules is said t6 have done; not, however, after the way of modern times, but by turning the River Alpheus through the stable, which immediately carried away the dung and filth. The condition of many a modern farmer's barn would remind one of the Augean stable. So let it be cleansed, as by water, that none of the excrementitious matter, whether solid or liquid, shall be lost, but all so saved that it may be used to fertilize his gardens and fields, whence comes his daily bread.

Zenophon, who lived about four hundred and fifty years before Christ, recommends the use of earth that has long been under water, as a fertilizer of the soil—so that the use of peat and mud from swamps and ponds is no new discovery. He also recommends the growing of and the ploughing in of green, leguminous crops as a manure, remarking, that they "enrich the soil as much as dung."

Virgil, who lived from seventy to nineteen years before Christ, wrote concerning the advantages to be gained by a rotation of crops; recommended nitrum, not saltpetre, as many translate, but the carbonate of soda, or of potash, mixed with the dregs of oil, as a preparation for swelling seed grain before planting; suggesting the advantage of scattering ashes over exhausted soils—thus indicating no slight knowledge of the methods of artificial fertilization then known; speaking not only of ordinary manure, but of special manures, such as pumice stone, shells, &c. Pliny, who wrote about one hundred years later, says, "There are many kinds of manure, and the thing itself is very ancient." Varro, one of the most learned men of Rome, who lived about one hundred years before Christ, was so minute in his enumeration of animal manures as to mention the dung of blackbirds, thrushes, and other birds kept in aviaries. Cato, Theophrastus, and Columella display a knowledge of compost manures that would be creditable to American farmers of the eighteenth century—occasionally throwing out suggestions that would do credit to a Massachusetts or New York farmer even, of the present day.

The Greeks and Romans very generally, at the commencement of the Christian era, associated the ideas of successful husbandry with the careful accumulation of manures and their liberal use. They considered the application of manure as one of the principal operations of agriculture, and placed it next to ploughing. They were so sensible of the advantages arising from the manuring of their fields that they were very careful in finding out and collecting all such things as were found proper for the purpose. They carefully gathered the dung of their cattle—littered them with straw or stubble, which they mixed with the droppings of the animals—collected all kinds of ashes—different kinds of earth—burned trees, shrubs and stubble in their fields for the ashes—and frequently sowed pulse—not cereal grains—to plough in as a green manure. "You may make manure," says Cato, "of stubble, lupines, bean stalks, oak leaves, straw, and chaff. From the wheatfield pull out the dwarf elder, hemlock, the tall grass, and reeds in the willow plantations, and lay them below the cows and sheep." Says Columella, "I am not ignorant that there are some farms in the country so stinted that neither the dung of cattle nor birds can be got. He is, however, a slothful husbandman that, even under such circumstances, has no manure. For he may collect many kinds of leaves, the cuttings of briers, and the rakings of the highways; he may cut ferns, which, though on the fields of his neighbor, will rather be an advantage than injury to him, and mix with the cleanings of the court yard; he may dig a hollow place, and throw into it ashes, the dirt of the kennels, and jakes, all kinds of straw, and every thing that is swept from the house." Again he says, "I think those husbandmen are not diligent who from each of their lesser cattle in thirty days make not a load of dung, and from each of their larger cattle ten loads, and as many more from each of the men who may collect not only what they make, but that which is produced daily in the court yard and house."

Says Theophrastus, "Some advise to mix earths of different qualities—for example, light with heavy, and heavy with light; fat with lean, and lean with fat; and, in like manner, red and white and whatever has contrary qualities; because this mixture supplies not only what is wanting, but also renders the soil with which another is mixed more powerful, so that what is worn out, being mixed with a fertile kind of earth, begins again to carry crops as if renewed, and what is naturally barren, as clay, if mixed, is rendered fruitful; for one kind mixed with another serves in some measure in the place of dung." "This suggested the idea of trenching every fifth or sixth year," says this writer, "by digging as deep as the rains penetrate—thus turning up the bottom mould by which the wheat fields are renewed, and thus bringing up the virgin earth to take the place of that which had been partially exhausted by cropping." Columella also mentions the practice of mixing earths of different qualities as having been performed with great success by his uncle—a learned, skilful, and industrious husbandman, who had thus enriched both his wheat-fields and his vineyards.

The present age boasts loudly of its progress and improvement over the past. How much improvement and advancement have the farmers of this nineteenth century made, in the use of barn-yard manure and the ordinary modes of composting, over that in use by the Grecians and Romans two thousand years ago? The preparation of poudrette from night soil was known long ago to the Chinese. Ashes were used and preferred to barn-yard manure long since by the Britons, as well as by the Romans. In the early part of the middle ages, calcareous sand was used by the English farmers as a manure. Even sea sand was employed as a fertilizer, in the counties of Devon and Cornwall, for the improvement of their arable lands. Carbonate of soda or of potash, we have seen from the history of the past, has been used in steeping seeds and as a fertilizer; and several kinds of saline substances and preparations have long been used in Briton, both for preparing seeds and as fertilizers. An agricultural writer three hundred years ago made a record that some farmers believed coleworts, a species of cabbage, grew best in salt ground; and therefore they employed salt as a manure, also saltpetre and ashes. A writer near the close of the seventeenth century says, "Rains and dews, cold and dry winters, with store of snow, I reckon equal to the richest manures, impregnated as they are with celestial nitre; and I firmly believe that were saltpetre, I mean fictitious nitre, to be obtained in plenty, we should need but little other compost to meliorate our grounds."

A compound of lime and common salt, it is said, was recommended more than two hundred years ago by Glauber, a distinguished German chemist, in his Hints on Agriculture, as most fit for dunging lands, and to be used instead of animal excrements; and the same preparation was described and commended towards the close of the seventeenth century by Christopher Packe, as the cheapest of all mixtures for the enriching of poor and barren land.

Gypsum began to be used as a manure after the middle of the last century; so also did fish; since when they have been extensively employed. Guano, though universally used by the

Peruvians as far back as their history extends, was not commercially introduced into England till 1840. So of crushed bones, and many of the artificial specifics, used as manures; some of them, being called composts, were not known until a recent period.

Having thus briefly sketched the history of the subject under consideration, it is time to proceed directly to its discussion.

Manure is defined by Dr. Lieber, the author of a German Lexicon, to be "vegetable, animal, and mineral matters, introduced into the soil to accelerate vegetation and increase the production of crops." Loudon, in his work on Agriculture, says, "Every species of matter capable of promoting the growth of vegetables may be considered as manure." Professor Low, in his Elements of Agriculture, says, "All substances which, when mixed with the matter of the soil, tend to fertilize it, are in common language manures." Mr. Johnson, in his Farmers' Encyclopædia, says a manure may be defined to be any fertilizing element, whether a compound or simple ingredient, if added to a soil of which it is naturally deficient. In these definitions, Professor Liebig and Dr. Dana, two modern writers on manurial specifics, agree.

Professor Low classifies manures as follows: 1. Animal and vegetable manures; 2. Mineral manures; 3. Mixed manures.

They are also classified into organic, inorganic, and mixed; into animal, vegetable, and mineral; nitrogenous, carbonaceous, saline, and earthy; general and special; natural and artificial; simple and compound; massive, powdery, and liquid; diffused and concentrated; volatile and fixed; ephemeral and permanent; chemical and mechanical; top dressings, and incorporated and buried manures; into such as contain the prepared food for plants, and such as resolve themselves by decomposition into the food of plants; such as partly or wholly combine with ingredients in the soil, or the atmosphere, to form the food of plants; such as absorb and store up their food from the atmosphere; such as eliminate their food from the soil; such as increase the absorption and nutrition of plants by stimulating or strengthening their organism; such as increase their absorption and nutrition by improving the mechanical condition of the soil; and such as increase the vigor and luxuriance of plants by diminishing, modifying, or destroying substances in the soil which are injurious to their growth. These classifications, though from the nature of the subject necessarily very imperfect, serve, nevertheless, to aid the inquirer in gaining a knowledge of it, as well as the farmer and gardener in the practical work of preparing and furnishing plant nutrition.

The art of rightly applying manures to different soils, and for the promotion of the growth of different plants, as well as the neutralizing of noxious agencies, requires no small amount of careful observation, experience, and skill. The herdsman that should feed his oxen with beans, the shepherd that should fodder his sheep with rye straw, or the groom that should feed his master's favorite horse on swamp hay and onions, would be laughed to scorn by every body but the cockney. Yet worse blunders than these are continually made by such as are called farmers. It is just as important that the farmer and gardener should know how to feed their plants as their animals. It is no more certain of your Indian corn, if it be only half fed, that you will gather more than half a crop, than it is of your cow, if treated thus, that she will yield more than half a mess of milk. So of your other crops and animals; they must all be fed with food precisely suited to their wants, such as is best adapted to promote growth and maturity. It would seem, then, if the farmer only knew how, that he might prepare his ground here for producing wheat or any other grain or product suited to our climate, and be almost as sure of a bountiful harvest as of a seed time.

The combinations of matter that enter into the organization of plants are almost infinite, though the original elements are few. Chemistry has discovered less than sixty elements in the material world, called "simple substances," so named because incapable of reduction. Of these, only four enter in any considerable degree into the formation of plants—namely, *carbon*, which forms from forty to fifty per cent. by weight of plants cultivated for food; *oxygen*, forming nearly one-half of the crust of the globe, twenty-one per cent. of the atmosphere, eight of every nine pounds of water, and nearly one-half of the living organisms of plants and animals; *hydrogen*, the lightest of known substances, constituting one-ninth part of the weight of water, and entering but slightly into the composition of animal and vegetable bodies; and *nitrogen,* constituting seventy-nine per cent. of the bulk of the atmosphere, and forming a part of most animal and vegetable substances. Plants, then, being composed chiefly of carbon, oxygen, hydrogen, and nitrogen, must be fed with these in due proportion in order to produce a vigorous growth and an abundant harvest in return for the labor, skill, and care of the husbandman. The carbon is derived from carbonic acid, oxygen from the atmosphere, hydrogen from the decomposition of water, and nitrogen from ammonia, absorbed by water, and received by the plants through their rootlets. Earthy particles and salts are always present in plants. In composting manures, the aim of him who engages in it is, or should be, to provide food for plants by furnishing them with carbon and ammonia, materials found in great abundance in the decomposition of both vegetable and animal matter.

The food of man and his domestic animals depends, chiefly, both as to quantity and quality, upon his skill and industry, as manifested in his coöperation with Nature in the production of such vegetables as are needed for growth and nutrition in the animal kingdom, such as are either immediately or mediately dependent thereon.

It is a law of Nature, that the higher the grade of the animal, and the more complicated its organism, the greater the necessity of a corresponding degree of food. Man is the noblest creature that God has made on the earth, and, consequently, has the most complicated and highly-wrought organization of animated nature. How, or upon what, shall man subsist? What does the best economy of his system require? A critical, c emical analysis of his body, fed and nourished under the direction of knowledge reflected upon the subject by the light of physiology, will show its composition, and, therefore, demonstrate what elements the soil needs to produce bodily nutrition. Those elements will be found most important as fertilizers of the soil that enter most largely into the growth and maintenance of the human body. Man, in his present state, is both an herbiverous and carniverous animal, being composed organically of all those elements that enter into the various organisms upon which he has subsisted, and still subsists.

The manures most common are animal, green crops, peat, muck, mud, poudrette, bones, guano, fish and animals, refuse of factories, wool, soot, ashes, lime, marl, phosphate, superphosphate, gypsum, salt, and other specifics and compounds too numerous to mention.

Composting consists of mixing the different manurial substances; or, in other words, of converting the animal or stable manures into compost, by mixing them with some or all of the following—to wit, loam, peat, muck, pond mud, cleanings of drains, wash of roads, leached ashes, using sandy loam or marly clay, according to the nature of the soil where the compost is to be used. Into your compost heap throw weeds before the seeds form, straw, litter, animal excretions, night soil, the urine of the stables and all that can be saved elsewhere, the wash from the sink drain, the suds of a washing day, and every thing else whose decomposition and fermentation furnish fertilizers for the soil, and which would otherwise render your premises filthy and stenchy.

Every farmer has ever-producing resources of some or all of these manurial substances, which he cannot well afford to lose, and which, if saved and composted, would enable him to make several cords more of manure than hitherto every year, which would readily sell, if he has no land upon which he wishes to use it. Besides, he will keep his premises clean and free from offensive smells, indicative not only of bad economy, but of a very criminal disregard for health and comfort. There are many who call themselves farmers that would consider themselves wronged if any one should question their claim to this noble title; who claim to be great economists, yet have never learned the distinction between economy on the one hand, and stinginess and parsimoniousness on the other, having no claim to the former, yet possessing the latter in full exercise in all that pertains to the mental improvement of their families; that suffer filth and nastiness of every kind to accumulate about the "back door" and yard, being horribly offensive; with a drain, perhaps, from both hogsty and barnyard, pouring the liquid manure into the highway, a nuisance to every passer by.

The following directions for making compost manure are taken from Sprengel's late work on Manures. The right was patented in Germany:—

"First, take a layer of twenty inches in thickness of straw dung, or straw, dry leaves, weeds, potato stems, turf, muck, or marl. This is to be wet with dung water, or common water, and covered with night soil, poultry dung, street sweepings, pulverized bones, offal, kitchen slops, &c.

"Next, one-fourth of an inch of coal or wood ashes.

"Then three inches of good earth mould, or marl.

"Then eighteen inches of horse, sheep, or cattle dung—wetting it again with urine or common water. Then cover with a layer of pond mud, ditch scrapings, mould, muck, or marl.

"Next, one-fourth of an inch of coal or wood ashes; and then a second course of straw dung, ashes, mould, or marl, horse, sheep, or cattle dung, with a final covering of mud, muck, or marl. From two to three weeks in summer, and from four to six weeks in winter, are required for the fermentation. If in any part of the mass the heat be too great, it should again be covered with loam or mud and wet with water. If any part does not ferment, holes are made, that the air may reach these parts. When the mass is properly fermented and the substances decomposed, it should be well wet with water, worked over, put up in heaps from six to eight feet high, and covered with rich loam to the thickness of ten or twelve inches. After standing a few days, it may be carried to the fields and harrowed in with the grain, or ploughed in for other crops."

Farmers are not yet fully aware of the treasure they have in their peat swamps. Dr. Dana, of Lowell, has done more, perhaps, than any other scientific man to develop the value of these collections of decayed vegetable matter. Experience and science have taught the farmer how to use these vegetable deposits of manurial substances. To bring out the ammonia, the muck, whether peat or mud, must be fermented—which may be effected either by the use of alkalies or composting with fresh stable manures. Take from fifteen to twenty bushels of ashes, or potash ninety pounds, or soda about sixty, to a ton of peat. Such a compost will contain about the same amount of ammonia as cow dung. One of the best methods of preparing peat is, that of mixing it in the yard where cattle, sheep, and hogs are confined. It thus becomes impregnated with the urine of the animals, much of which would otherwise be lost; and this renders the peat, as a fertilizer, equal to the solid excrements of these animals; for, in addition to the urine, it absorbs the leachings of the solid manures. Mr. Phinney, of Lexington, says that a load of green dung will convert two loads of peat, if well mixed, and make them equal in value, as a fertilizer, to itself uncomposted—that is, one load of green dung, mixed with two loads of peat, will make three loads of compost equal to three loads of green dung. It is said of a farmer in Watertown that he makes no use of his green dung as a fertilizer, though he keeps a large stock of cattle. He sells it, and mixes the leached ashes from his soap and candle factory with peat, in proportion to one part of such ashes to three of peat—thus keeping his farm in a high state of cultivation. He digs his peat in the fall, and in the spring mixes the ashes with it by shovelling it over three or four times.

It is claimed, by such as have experience, that peat should be taken from the swamp in the month of August or September, and suffered to lie through the winter; and in the spring it should be opened and mixed as aforesaid, one part of green dung to two of peat, or of leached ashes, one to three. Unslaked lime may be used to accelerate fermentation. Composted thus, it will be ready for use in the fall. Peat or muck for the hog yard or barn yard should, also, be taken from the swamp about six months before it is put into the yards. Pond mud, though not so rich in humus as peat or muck, is a valuable fertilizer—its action being more immediate than that of unfermented peat, owing to its greater proportion of salts and silicates.

In the winter of 1839–40, Mr. Whalen, of Saratoga county, New York, took from a pond on a creek one thousand loads of pond muck, and put it on to a field of light sandy or gravelly soil which had been thoroughly exhausted by cropping until it produced nothing but sorrel and mullein. This muck was spread and ploughed in, and the field planted to corn, which yielded fifty bushels to the acre. The next winter he took out seven hundred loads, and applied it to two other fields with similar results. He has also taken muck from an ash swamp with similar results. This mode of fertilization has caused these worn-out fields to produce good crops of oats and grass, as well as corn, where nothing scarcely grew before.

Every farmer should place swamp muck or peat—and if he cannot obtain these, loam will do—under his stable floors to save the urine, most of which otherwise will be lost. Proper economy will enable many farmers that think they are very saving to make double the manure every year that they now do. If the old maxim—"Money saved is as good as money earned"—be true, then it is equally so, manure saved is as good as manure bought.

It was recently stated in an agricultural journal that the United States now import about two hundred thousand tons of guano annually, at an expense of two million six hundred thousand dollars, furnishing, probably, not more than one farmer in a hundred thousand with this costly fertilizer. To prevent this importation, as well as the necessity of the purchasing of superphosphate and other expensive artificial fertilizers, it is proposed that every family of four persons shall, by the due exercise of the virtue of cleanliness within doors and about the immediate premises, make annually, or rather save, what shall equal a ton of guano. Thus might two hundred thousand families save by skill and care what now costs the country two million six hundred thousand dollars. Add to this what might be made by those who keep a cow, hog, and horse, with the poultry yard, and you would have what would equal another ton for every family establishment. Thus might be saved, were this economy introduced throughout the United States, a quantity of manurial substance equal to two hundred thousand tons of guano, which, at fifty-eight dollars per ton, the price of guano, would equal eleven million six hundred thousand dollars per annum.

Thus it would seem that if every farmer and consumer of Earth's products would save all, by taking heed that nothing which can be used as a fertilizer of the tilled and cropped soil be wasted, the necessity of importing manures or purchasing super-phosphate would soon be known only as connected with the history of bad economy. The sources of foreign manures are by no means inexhaustible, and, if resorted to, to any considerable extent, would soon be exhausted; besides, it is bad, exceedingly bad national policy to purchase of a foreign government what care and attention might secure at home. He who suffers his crops to waste away and return to the earth and air whence they came, when ready to harvest, is not regarded either as a good or provident husbandman. Neither should he be who fails to save, and compost, and return to the field those elements necessary to feed, nourish, and promote the luxuriant growth and maturity of such plants as are cultivated and produced for the growth and sustenance of both man and beast. May this subject be duly considered by all who are engaged in farming and gardening.

Having thus presented the subject of manures, composting, &c., it is hoped that the farmers of the Hampshire Agricultural Society will here find such facts and suggestions as shall serve to incite them to the exercise of greater diligence, economy, and skill in saving, composting, and applying specific manures. Manure is to plant-culture what food is to your stock. Be as eager, then, to save and provide manure to feed your plants as fodder and provender for your cattle and hogs. It is no more essential to your thrift and prosperity as a breeder of stock that you should know how to feed your animals so as to promote their most rapid growth and maturity than it is that you should know how to cultivate and manure your land so as to secure the greatest possible return in crops for the capital and labor invested. In other words, it is as essential that you should know how to feed your plants as your animals. Neither will grow and mature to perfection unless rightly fed and nourished. Both the quantity and quality of what the farmer and his domestic animals subsist upon, from his tilled acres, will depend chiefly upon his skill as a husbandman.

In order to compass the end that every good farmer should have in view, to wit, to secure the greatest possible return for labor and capital invested in farming, he should read and study carefully the best-written treatises on agriculture; read the most intelligibly-conducted agricultural journals; converse with his neighbor farmers, such as are actively engaged in improving their soils—such as produce the largest crops, the best cattle, the finest and fleetest horses, the most profitable sheep, the most desirable breed of hogs, the choicest varieties of the different species of poultry, &c.; also concerning the best and most economical methods of farm management, including the implements, so as to be able to select the best kind of plough, seed planter, cultivator, mowing machine, horse rake, &c.; also to learn the art of ploughing different soils, whether deep or shallow; whether it is cheaper to use oxen or horses as a team; the mode of seeding with grain; when; and whether it be better to sow grass seed in the fall or spring; how to save, mix, compost, and multiply manures so as to produce the greatest possible amount from the materials employed; ascertain how to use them on the soil to the best advantage; in the rotation of crops, learn whether it be better to take two crops of corn in succession from the same field than one; how to employ all labor-saving machines, so called, in order to cheapen labor by gaining or saving time; also to learn something every season by careful and intelligent experimenting and observation,—so that his growth in knowledge, experience, and wisdom in his noble vocation shall more than keep pace with the progress and improvement annually developed in the skilful management of his farm. Then will farming not only pay, but will become, also, a source of pleasure and delight akin to that enjoyed in horticulture before man received the sentence, "In the sweat of thy brow shalt thou eat bread." The hand, when guided by a well-instructed mind and pure taste, all under the influence and promptings of a good heart, will so beautify the farm acres as to render every farmer's home a fit dwelling-place for Nature's truest nobleman—the FARMER.

Report of the Committee.

What your committee find specially to commend in the practice of Mr. K. Hubbard is, that he digs up and brings to his pig pen and yard, in those parts of the year when farm work is least pressing, sufficient swamp muck to completely deodorize the excrements of the animals, and to retain all their fertilizing properties till wanted by growing plants—thus doubling, and in some cases quadrupling, the quantity of manure, without detracting much if any thing from its quality.

J. A. Nash.

Statement of Kelita Hubbard.

I have tried several methods of composting manures, with swamp muck, by mixing it with barn-yard manure, ashes, plaster, &c., and I find it profitable. But on my swamp I have a large quantity of sage bogs, which I have found very difficult to work into manure, and had considered them worthless until I commenced throwing them into my hog pen. I have found, for three or four months in a year, the hogs would work them to pieces, and make some of my best and cheapest manure. My practice is to commence about the first of August, and cart them green to my hogpen, throwing in daily as many as they will work up. I have eight shotes, which will usually demolish a cart buck full in two days, varying according to circumstances of feed, state of the bogs, &c.

These shotes make manure in three or four months worth	$35 00
Cost of getting the bogs, above the benefit hogs receive from eating the roots, of which they are very fond, ...	5 00
Net gain, annually, ...	$30 00

Sunderland, October 18, 1854.

Statement of Avery D. Hubbard.

The question is often asked, "How can we take a crop from our land every year, and keep it as good as when we commenced?" And "How shall we obtain a good crop and improve our land?" is a still harder question to answer. I have become satisfied that the way in which most land is managed, after taking off a crop of grain in the summer, does not tend to improve it. Most land that is to be cultivated the next year, after taking off a crop, will produce a heavy coat of weeds, which, if turned under, will be destroyed and the land benefited. But, some say, we do not like to have our land lie exposed to a hot sun three or four months. Then sow on a crop of rye immediately; it will cost but little. A good deal of seed scatters when you gather the grain, in many instances; so that less than one-half a bushel will be enough seed for an acre, and the feed in the fall more than pays the cost of seed and ploughing. You will have a green crop of rye to turn in as manure in the spring, worth, according to my experience, five or six loads of manure to the acre. I would say, then, to brother farmers, Turn over your stubble land, where you intend to cultivate next year, as soon as possible, and scatter on a little seed, and you will see a marked change in the land. It will produce a heavier crop of corn, or rye, or oats, with the same manure, and you will receive some indirect benefits in many ways, some of which I will name:—

1. You will thoroughly pulverize the land, so that you will save more in fitting your land for a crop, and in first hoeing, than all it cost you the year before.

2. You will destroy the seeds of all noxious weeds by turning them under before they ripen.

3. You will be very apt to plough deeper. The team, having become thoroughly rested since you finished your spring work, will take hold with a "will;" and if the plough goes into the old "hard pan" which has been formed in years back they will not stop, but turn up two or three inches of it, and so give the roots a chance to run down, which I have found to be of great benefit the past dry summer.

SUNDERLAND, October 10, 1854.

WORCESTER WEST.

From the Report of the Committee.

As to the best mode of adding to the quantity and quality of manure, we are of the opinion that barn cellars are the most proper place. Your committee, having had some experience, speak with confidence upon the subject. We would, therefore, urge upon the farmers, large and small, the necessity of having barn cellars; especially would we urge this upon those about to build.

JOB RANGER, *Chairman.*

Statement of B. F. Hamilton.

My manner of making compost manure is as follows: My cellar is one hundred feet long and forty-two feet wide. I commence by laying loam to the depth of about two feet on the bottom of the cellar, directly under the stable where the cattle and horse stand. When a sufficient quantity of manure and urine has dropped from the cattle to receive another layer of loam, I apply it, and continue in this manner until I turn my cattle out to pasture. I then have it all shovelled over and mixed together as much as possible, and let it remain until I want to apply it to mowing lots and fields where I intend to plant the next season, as I have a year's stock on hand. The part of the cellar where I keep my hogs I manage in the same way, except that they work it over free of charge, and make a large amount of the best kind of manure for the farm. I have increased my crop of hay very much, and enriched my ploughed fields, by applying manure in the above manner. I do not believe there is a good farmer who would not have a cellar under his barn if he were sensible of the benefit it would be to him. I make three hundred and fifty loads yearly of the best kinds of manure. My barn is so constructed that I can drive directly through the whole length of the stable on the north side, and drop the loam through the scuttle down into the cellar just where I want to use it. I have a scuttle in the centre floor, where I drop the loam or muck for my hogs. It is thus but very little labor to furnish loam to mix with the manure, and also for my hogs to work over, as they are always very glad to get fresh loam, and are sure to put it to the best possible use.

PLYMOUTH.

From the Report of the Supervisor.

Five claims have been entered to the premiums offered for the greatest quantity of the most valuable compost manure, and statements made. The applicants return a less number of loads than was common in former years. The manure, no doubt, will produce more visible effects per load than that in which greater quantities of surface soil and swamp muck are incorporated; but the remote effects will be far less. The vegetable mould in soils is annually lessened in the growth and removal of crops. When little is applied besides excrementitious matter, we fail of restoring the loss. We want the substances which Nature has lodged in numerous reservoirs, some of which are found on almost every farm, not as rich as deposits of Peruvian guano, but abounding in the component substances of plants. We think it highly important to the prosperity of farmers to encourage an extended use of swamp muck. The influence of the atmosphere, with a small portion of alkaline matter, will often convert it into a valuable and enduring dressing for land. The salutary and abiding effects of meadow mud are clearly seen in the renovation of a very barren tract of land by Mr. Littlejohn, of Middleboro'. On fields which formerly would have produced not more than twenty-five bushels of Indian corn to the acre he now reaps more than eighty. His mowing grounds and pastures were, the past season, green and flourishing, while neighboring lots were parched with drought. The use of concentrated manures has a tendency to confine our attention to the influence on a first crop; the true interests of the farmer demand attention to ulterior influences. The land, like the human body, may be essentially injured by too frequent and copious administrations of powerful stimulants. It should be our purpose to incorporate in the materials of every dressing a large portion of the elemental substances of plants; therefore great heaps of compost should be encouraged.

There has been great similarity in the operations of the competitors in composting, with one exception. Mr. Roberts makes all his manure under cover, and seems unreasonably afraid of the influences of the sun and atmosphere on the compost heap. Excrementitious matter is manifestly impaired in exposure to sun and air; but in well-managed compost heaps other materials are kept on the outside, and such as sun and air constantly improve. We think a good farmer will every year make more compost than even the largest cellar would contain, and believe it practicable for him to compost in the open air without much loss. Swamp mud, recently dug, needs greater action of the atmosphere than it will have in the barn cellar.

Statement of Amasa Howard.

As a competitor for the premium on manure, I will state how mine was composted. From two pens, where I have kept on an average eight swine, I have made seventy loads, one of the pens being connected with the sink drain from the house. My stable has been occupied by from two to four horses, and from the cellar I obtained one hundred and twenty-two loads. I have kept one yoke of oxen, four cows, two heifers, and one horse, through the winter, in my barn, and the oxen are kept there through the year. In that and in the yard adjoining I have made three hundred and twenty-two loads; and in my compost heaps, composed of muck, loam, soil, ashes, lime, and other materials, I have ninety-seven—making in all six hundred and eleven loads of forty cubic feet each.

Statement of Jonathan Copeland.

I make the following statement of the manner in which my manure was made: The most of it was made in the barn cellar; meadow muck and upland soil, mixed together, were the principal. My stock last winter consisted of six oxen part of the winter, four oxen all winter, four cows, one two-year old, one horse, and five swine, kept in the barn cellar all winter on the droppings of my cattle and horse. The remainder was made in the hog yard near my house, where it had the wash of the sink, with mud, loam, weeds, ashes, &c. We have kept from five to ten swine the past season, and made and applied to my farm three hundred and seventy-six loads, of forty cubic feet per load.

Statement of Orsamus Littlejohn.

My swamp mud is of that kind in which skunks' cabbage delights to grow. My barn cellar, yards, and vaults are kept well supplied with this muck, to absorb all the liquids that should be saved for the compost heap and keep the air pure. These vaults, &c., are cleaned out twice a year, and heaped up with more muck, rich loam, (to give weight,) burned oyster shells, refuse salt, ashes, and water sufficient to thoroughly wet the whole mass. It is then covered over with dry mud, coal dust or soil, and left to ferment and become healthy for the soil and crops. In this way I have made, the past year, three hundred and twenty-five loads (of forty cubic feet) of manure, worth more for porous soils and rotation of crops than common stable manure is, in my opinion, but costing less than one cent the cubic foot. I charge nothing for the droppings of the stock or the mud, as it lies in the meadow.

Statement of Nahum Snell.

Having entered as a competitor for the premium offered by the Plymouth County Agricultural Society to the person who shall make the greatest quantity of compost manure, I will state, that I have drawn out the past year three hundred and fifteen loads of manure, made from the droppings of ten head of cattle and four horses into a barn cellar, where have been kept from ten to twenty hogs, and carting muck from a swamp, and loam sufficient to absorb the moisture; then I had the benefit of four privies, together with a quantity of ashes collected from turf and bushes, which I drew from a swamp where I collected muck.

Statement of Austin J. Roberts.

Being a competitor for the greatest quantity of compost manure, I have drawn up the following statement: My barn, sixty by forty feet, contains a cellar, extending its whole length and width. This cellar is divided into various compartments for swine, and is used entirely and exclusively for the whole of our summer and winter accumulations of manure. A large barn yard is attached to the cellar, which is, however, of little or no use in the manufacturing of manure, as, from repeated trials, I have found the value of dung greatly enhanced by being secured from the effects of the sun in summer, and of frost and the drenching rains in winter. Our horses and cattle are well littered or bedded down with straw and coarse hay the year round. Their droppings are thrown into the sties in the cellar below, there to be worked over and incorporated by the hogs with muck, peat, straw, dirt, and refuse vegetable matter, weekly thrown in. On all this, barrels of chamber lye, and the suds of the wash house, are poured from time to time. I consider that manure is one of the most important objects in the business of rearing swine, and think that, by proper management, store pigs will pay for their keeping by the manure they make. My practice is, to haul out all the manure required for the crops into the fields where it is to be used, and there to compost with muck, dug the autumn of the previous year. This is usually done in March; and a compost thus made of one-third muck and two-thirds manure is the best that can be applied to sandy loams. My compost manure, since November, 1853, amounts to three hundred and three loads of forty cubic feet. On account of being housed and well prepared, I consider the quality of my manure far better than that made in the ordinary way.

INDIAN CORN.

ESSEX.

Statement of Charles Holt.

I offer for premium one acre of Indian corn—part of a field containing three and a half acres—on the town farm in Haverhill. The land is interval, of good quality, has been in grass ten or twelve years, and in 1853 yielded from three-quarters to one ton of hay. It was ploughed last fall ten inches deep, and in the spring seven and one-half cords of barn and hog manure were well mixed with the soil, by drawing a large cultivator across the furrows, without disturbing the sod. It was planted, the 20th of May, three feet ten inches apart each way, four or five kernels to a hill, of large eight-rowed corn. The field was hoed three times, and a cultivator run through it twice each way. Early in August the suckers were cut out to feed cows; and it was harvested in the usual manner on the 3d of October, yielding one hundred and fifty-seven baskets of sound corn. But the appearance of the ears indicated that the crop was somewhat injured by the drought. On the 6th of November, two baskets were found to contain sixty-eight pounds of shelled corn.

HAVERHILL, November 6, 1854.

WORCESTER NORTH.

From the Report of the Committee.

In looking over the several fields entered for premiums, and comparing the weight of each, the committee are satisfied that many of the farmers do not plant their corn near enough together, while others plant too near. Had Mr. Joel Hayward, instead of planting twenty-one hills to the rod, planted thirty, he would have taken a premium this year; and had Mr. Benjamin Wyman, instead of planting thirty-eight hills to the rod, planted thirty, he would have had as much as he now has, with less expense in cultivation.

Statement of Lewis G. Tuttle.

The ground on which I raised my best piece of corn was broken up in the fall, cross ploughed in the spring, about twelve loads to the acre of green manure being turned under. It was planted about the 25th of May, and about two-thirds of a shovel full of compost put in each hill. Thirty pounds of guano and eight bushels of ashes were applied to the corn just after it came up. The corn was hoed three times. I estimate the labor of cultivating the crop at twenty-one days' work. Weight in the ear, to the square rod, fifty-five pounds. Number of hills, to the square rod, thirty. The variety was Tuscan white.

FITCHBURG, 1854.

Statement of Joseph Upton.

The ground on which the acre of corn grew, which you examined on my farm, was mown last year, and ploughed up in the fall nine or ten inches deep. Last spring it was cross ploughed about the same depth. Wishing to try an experiment with guano in raising corn, I manured that acre as follows: On two-thirds of it I spread twenty cartloads of manure from my barn cellar, and ploughed in lightly; on the other one-third I sowed two hundred pounds of guano, and harrowed it in. I then planted twenty-three hills in rows one way, with corn called the Tuscan white, putting a small handful of plaster and ashes in each hill. I hoed it but twice, the first time about the middle of June, the second about the first of July.

The expense of cultivation is as follows, calling labor one dollar per day:—

Ploughing, three times, ...	$7 00
Harrowing and furrowing, ...	1 00
Twenty loads of manure, ...	20 00
Carting and spreading the same, ...	3 00
Two hundred pounds of guano, ...	6 00
Plaster and ashes, ...	4 00
Hoeing and ploughing twice, ...	6 00
	$47 00

Statement of Benjamin Wyman.

The acre of land on which I raised the crop of Indian corn entered for premium the present year is of a gravelly soil, and was planted last year, partly with corn and partly with potatoes. It was manured with about twenty-five loads to the acre. The present year I spread thirty-five loads of winter manure, and dropped fifteen loads of compost manure in the hill, to the acre, twenty-five bushels to the cartload. I ploughed the land twice, and planted it on the 23d and 24th days of May. It was hoed but twice.

The expense of cultivating the acre is as follows:—

Fifty loads manure, ...	$50 00
Carting and spreading the same, ...	10 00
Ploughing twice, man and oxen, ...	4 00
Harrowing and furrowing, ...	1 00
Two days' planting, ...	2 00
Hoeing and ploughing twice, ...	6 00
	$73 00
Deduct two-thirds for manure not exhausted,	33 66
	$39 34

Yield, forty and and one-half pounds to the square rod, each rod containing thirty-eight hills.

WESTMINSTER, 1854.

HAMPSHIRE.

Statement of Austin L. Clark.

The piece of corn I offer for premium contains one acre of land. It was an old pasture, that was never ploughed within the memory of the "oldest inhabitant." In May I ploughed it about six inches deep, turning in ten loads of barn-yard manure. I then harrowed in eight loads of compost manure. On the 26th of May it was planted. Eight bushels of leached ashes were dropped in the hill. The corn was hoed twice. The hills were not raised, and were three feet apart each way. The soil was a clayey loam. On the 14th of September the crop was harvested.

Value of crop:—

Seventy-five bushels of corn, at $1, . .	$75 00	
Four thousand eight hundred and ninety-five pounds of fodder, at $6 per ton, . .	17 47	
Four and one-half bushels of soft corn, .	1 12	
		$90 59

Expenses:—

Eighteen loads manure, ...	$18 00	
Eight bushels leached ashes, . . .	80	
Ploughing, harrowing and hauling manure, .	6 00	
Planting and seed, ...	1 25	
Hoeing and ashing, ...	3 50	
Cutting and stacking, ...	2 00	
Carting and husking, ...	6 00	
Interest on land, ...	5 00	
		42 55
Net gain, ...		$48 04

SUNDERLAND, October 25, 1854.

Statement of Chester Cowles.

I offer for premium a crop of corn raised on three acres. It was old pasture land. I seeded it down and mowed it two years. In November, 1853, it was ploughed with the double Michigan plough. In the spring I harrowed it over. I then carted on my barn-yard manure at the rate of fifteen loads per acre. I then spread it and harrowed it again. The corn was planted by the hoe on the 10th of May. It was hoed three times after the first hoeing. I put on plaster and ashes mixed together. In the second week of September I harvested the crop.

Value of crop:—

One hundred and eighty bushels, at $1,	$180 00	
Eight baskets of soft corn,	2 00	
Corn fodder, estimated,	18 00	
		$200 00

Expenses:—

Forty-five loads of manure,	$45 00	
Ploughing and spreading,	17 00	
Seed and planting,	4 00	
Hoeing and cultivating,	23 00	
Cutting and stacking,	7 00	
Carting and husking,	15 00	
Interest on land,	18 00	
		129 00
Net gain,		$71 00

AMHERST, November 14, 1854.

BERKSHIRE.

From the Report of the Committee.

Forty-five pieces were entered for premium. On three-acre pieces we gave H. D. Palmer, of Stockbridge, the first premium; L. Foot, of Lee, the second; and G. W. Wood, of Lanesboro', the third. Mr. Palmer's field contains four acres, and was in corn last year. It received twenty-five loads of compost per acre. This year thirteen loads of compost per acre were harrowed in. Thirty-one and one-fourth hills to the rod gave fifty-four and three-fourths pounds. Mr. Foot's land was in oats last year; no manure was used. This year twenty loads of long manure ploughed in, and ten loads of short put in the hill, per acre; one-half the field was planted to eight-rowed and the other half to twelve-rowed corn, thirty-two and one-half hills to the rod, giving fifty-three and one-half pounds. Mr. Wood's ground was sward land, ploughed six inches with ten loads of manure spread on; and one hundred and fifty pounds of plaster, per acre, put in the hill; forty hills to the rod gave fifty-three pounds.

For the best one-acre pieces we gave Rev. J. V. Ambler, of Lanesboro', the first premium; Henry Smith, of Lee, the second; O. J. Farnum, of Lanesboro', the third; Edmund Joyner, of Egremont, the fourth; Cyrus Crosby, of Stockbridge, the fifth.

Mr. Ambler's ground was meadow, one-half of which was ploughed last fall and again this spring; the other half was ploughed this spring; all eight inches. We could discover that nothing was gained by ploughing last fall. Twenty-five loads of long manure were harrowed in. I planted 27th of May; leached ashes, twelve bushels per acre, were used on the hill before hoeing; the cultivator used first, and the plough at the last, hoeing; it produced sixty-one and one-fourth pounds. This field was tended almost wholly by a man above eighty years of age, who showed that, in his second boyhood, he had not forgotten what he had learned in his manhood. Mr. Smith's corn was on meadow ground. Thirty-five loads of long manure were ploughed under eight inches, ashes and plaster used in the hill, and plaster after hoeing the first time. Planted, 25th of May, with twelve-rowed Dutton corn, thirty-six hills on a rod, and produced fifty-eight and three-fourth pounds. Mr. Farnum's ground was in corn last year. This year ten loads of compost and seventy-five pounds of plaster were used. Planted, 25th of May, with twelve-rowed corn; hills three feet by two and one-half; cultivated and hoed twice; hills raised, thirty-two and one-half on a rod, and produce fifty-two and three-fourths pounds. Mr. Joyner's corn was on greensward. Ploughed ten inches; a few loads of hog manure harrowed in; one and one-half bushels of plaster and ashes were used in the hill. Planted, 26th and 27th of May, with twelve-rowed corn, twenty-seven hills on a rod, and produced forty-seven pounds.

NORFOLK.

From the Report of the Committee.

The committee on grain crops report only five entries of Indian corn. Many excellent fields of this staple production have been grown in various parts of the county; but the severe drought so discouraged the farmers as to deter them from entering their fields for premium. We know of several lots that yielded, with one exception, crops fully equal to those to which premiums were assigned, that were not entered. We are happy to state that the drought was less injurious than had been anticipated. The crop, though smaller than that of last year, is fully an average one, and, on good land well cultivated, amply repays the labor and expense bestowed upon it. We are aware of diversities of opinion respecting the profitableness of Indian corn, some farmers having discontinued raising it on account of its small returns; others affirming that it is less profitable than grass; others that it is the best crop they raise. A distinguished farmer grows no corn because in former trials he could get no more than sixty bushels from an acre! Others are satisfied with forty as a remunerating yield. We believe that on this subject most farmers have yet much to learn, especially in regard to what the yield may be when the land is properly prepared and cultivated. We apprehend that few know what their grain crop costs; at least their knowledge is so indefinite as to furnish no satisfactory opinion of its profitableness. By this we mean that they keep no exact account of their expenditures. The corn in the bin speaks for itself; but how much the land is worth; how much is spent for labor; how much for manure; what is the value of the stover,—these have scarcely ever been accurately ascertained. And without this knowledge it is impossible to determine what the corn costs. One farmer says that corn may be raised in Norfolk for fifty cents a bushel; another, that a dollar will hardly cover the expense. But neither knows what it does cost, for want of a system of farm accounts. The difference in their opinion looks very much as if they contented themselves with guessing. Some of our most judicious farmers, however, assure us in general terms that nothing pays better than corn, both in the crop itself and in the preparation of the land for grass. We have found the most favorable opinion on this subject in men who have taken the most pains; who have expended the most labor and money; who have ploughed deep and manured well; who have kept their land in the best condition. They certainly are the most competent judges. They observe that method of cultivation which in other things pays a good interest. No satisfactory inference against the profitableness of this crop can be drawn from the results of careless or superficial culture.

We are happy to observe that the spirit of improvement noticeable in other departments of agriculture has reached the cultivation of corn; that more inquiries are made as to the best methods of proceeding; that greater attention is paid to the selection of seed—a very important point, and one that hitherto has been much neglected; that the relative values of different varieties are carefully considered; that manure is more generally spread and ploughed in, while the quantity is increased and the quality improved; that high hilling is more discountenanced; that frequent stirring of the land by the cultivator and hoe is believed to be the surest preventive against the effects of long-continued drought; and that the old prejudice in favor of the widest distance between the rows is abating. The consequence is, that greater crops are raised from the same extent of land, and the question of profitableness is brought nearer to a definite solution. Some of the most rigidly conservative farmers admit that probably the highest results are not yet attained, and that the time may come when, with better knowledge applied to the culture of corn, eighty bushels may be grown upon the acre that now yields forty or fifty. It will then be found that no more profitable field crop is raised in New England.

J. M. Merrick.

Statement of B. N. Sawin.

The field entered by me for premium measures one acre and three-quarters. Though lying in one lot, yet for purposes of cultivation it may be considered as divided into two parts, one containing an acre, the other three-quarters of an acre. The acre lot was in corn in 1853. In December last I carted on to it three and one-half cords of compost manure from the barn cellar, and ploughed it in. In May I carted on three and one-half cords of unfermented manure, spread and ploughed it in, putting no manure in the hill. The other lot was ploughed, in November last, with Prouty & Mears's No. 36 plough. In May I harrowed across the furrows. I used four and one-half cords of unfermented manure, putting it all in the hill. On the whole field the furrows for planting were two feet six inches apart each way from the centre. Commenced planting the small, eight-rowed, yellow corn on the 24th of May, putting four or five kernels in a hill. A cultivator was passed between the rows before hoeing. The corn was hoed twice. The surface of the ground was left level. I should have said before that the ground was ploughed eight inches deep. The stalks were cut the first week in September. On the 7th of October Messrs. Sawyer and Merrick selected one rod, which was considered a fair sample of the field. The corn, when shelled, measured sixteen quarts, and weighed twenty-seven pounds. At fifty-six pounds to the bushel, (the society's standard,) this would give seventy-seven and one-seventh bushels per acre.

The expense of the crop was as follows, namely:—

Interest on value of land,	$5 25
Taxes,	54
$3\frac{1}{2}$ cords of manure, at $4,	14 00
8 " " " $5,	40 00
Carting and applying manure,	14 12
Ploughing and harrowing,	4 50
Furrowing and planting,	4 75
Seed, twenty-one quarts,	84
Crow line round the field,	12
Cultivating and hoeing,	7 17
Cutting and binding stalks,	4 00
Harvesting,	9 00
Cost,	$104 29

The value of the crop is as follows:—

Stalks,	$11 44	
Husks,	13 50	
Half of the manure unspent,	27 00	
Corn, 135 bushels,	135 00	
		$186 94

Amount brought forward,	$186 94
Subtract the cost, . .	104 29
Leaves as profit, . .	$82 65, or $47 24 to the acre.

DOVER, October, 21, 1854.

[Mr. Sawin afterwards modified his statement by saying, "Since my statement was made I have finished husking, and find by actual measurement two hundred and thirty-two baskets of sound corn. I have shelled several baskets, and found them to yield twenty quarts each of shelled corn—which result gives one hundred and forty-five bushels on the one acre and three-fourths."

We have examined Mr. Sawin's farm-account books, not only in reference to this crop, but to all his operations, and have the satisfaction of saying that he has the means of knowing exactly what he expends upon his farm and what he receives from it. His practice in this is worthy of imitation by every farmer in the county.]

Statement of William Pierce.

The acre of corn entered by me for premium was in corn last year. The soil is a light loam. It was ploughed, about the first of May, ten inches deep. On the 20th I spread six cart-loads of green manure, from twenty-five to thirty bushels to the load, and ploughed it in six inches deep, furrowing one way with the plough. The rows were three feet apart. Put one shovelful of compost manure in the hill, and planted the corn two and one-half to three feet apart in the rows, four or five kernels to the hill. Ploughed twice between the rows, and hoed twice. Harvested about the middle of October. One rod was selected by the committee which was considered as a fair sample of the acre. This rod yielded $26\frac{7}{8}$ pounds of shelled corn.

Expense of cultivation:—

Interest on land, at $80, ...	$4 80
Ploughing, ...	3 00

Half the manure,	$15 00	
Carting and spreading manure, and planting,	5 00	
Ploughing and hoeing,	4 00	
Cutting stalks and harvesting,	7 00	
		$38 80

Value of crop:—

76⅞ bushels of corn, at $1,	$76 87½	
Stalks and husks,	14 00	
		90 87½
Subtract cost of crop,		38 80
Profit,		$52 07½

Needham, October 25, 1854.

Statement of C. Breck.

[The committee on grain crops have received the following letters from Mr. Charles Breck, which are considered worth publishing—inasmuch as they show an extraordinary yield of corn that was raised without special effort, and with no view to a premium:]—

Mr. Merrick,—

Sir:—I promised to send you an account of two rare pieces of corn which were raised in my vicinity the present year. The first was raised by Messrs. E. and J. Sias on a farm formerly belonging to H. Inches, Esq. As the land was rough and rocky, and as nothing extra was expected, no particular account was kept. Noticing that it was more than a usual crop, I requested Mr. Sias to keep an accurate account of the quantity; which he did. There were one hundred and seventy-eight baskets of ears. On the 25th of October I assisted in weighing some of the shelled corn, and found that a basketful of ears gave thirty-six and one-fourth pounds of corn and ten and three-fourths pounds of cobs. We then took the same weight of corn on the ear (forty-seven pounds) and laid it by itself to dry more if it would. November 14 I weighed this same basket of ears, and found that it had lost three pounds. We then shelled the corn, and there were thirty-seven pounds of corn and seven pounds of cobs—the latter having lost three and three-fourths pounds, while the corn had gained three-fourths of a pound. I have measured the land—one acre and twenty-eight rods. At fifty-six pounds to the bushel, the yield is one hundred and seventeen and six-tenths—a fraction over one hundred bushels to the acre. The corn was the Plymouth county, or smutty white. Mr. Sias says that last year, as the land was very rough, with many fast rocks, and a part covered with slate ledge, it was manured very lightly, and yielded a very small crop; or as Mr. S. expressed it, "We slighted the corn, and the corn slighted us."

This year we put on seven cords of manure, part from the piggery, and part from the barn yard. The rows were about three and a half feet apart, hills two and a half feet apart in the rows. Before we had finished planting, our old manure was gone, and on one-eighth of the field we put into the hills manure green from the barn windows. On that part the corn did not come up. We planted a second time, which greatly reduced the yield, as, being later, it was more affected by the dry weather, and did not fill out half as well as the rest. A part of the field for several rods was a slate ledge, upon which we carted several loads of loam to cover the corn with. This portion was also much injured by the dry weather. Considering both of these things, and also that the dry season must have had a bad effect upon the whole field, and that the whole field was measured, and the whole corn in the field instead of that from a single rod, and the calculations made from actual weight, the crop must be regarded as an extraordinary one.

The other field belonged to Mr. J. F. Twombly, and, as you saw, is on the southerly side of Milton Hill. I did not see the corn until after it was harvested. As it lay on the floor, it appeared to me so large a crop that I offered to assist in measuring it and the land. On the 25th of October we measured the whole, except six or eight baskets that were in another place, weighing one basket in every ten or fifteen. There were two hundred and two baskets, which weighed, on an average, thirty-eight and a half pounds, the basket we used being a small one. We put one by itself to dry. November 14 I shelled it, and found that the corn weighed twenty-eight and a half pounds, and the cobs six and a quarter pounds, the whole having lost three and three-quarters pounds in drying. Adding the other six baskets, we have two hundred and eight, which, at twenty-eight and a half pounds each, would give one hundred and five and eighty-five one-hundredths bushels of shelled and dry corn. The land measuring one hundred and eighty-six rods gives ninety-one bushels to the acre. Of this piece no particular account was kept, as nothing extra was expected. A fair lot of manure was used, part in the hill, part ploughed in. The corn was planted in drills, rows from three to three and a half feet apart, the kernels about six inches apart in the drill. The manure falling short, a cord of green manure from the piggery was put in the drills on a part of the field. This manure was so strong that the corn did not come up, and had to be planted over again, and some of it a third time, which made it late; and consequently there was a large quantity of *pigcorn*, I should judge twenty or more baskets. But for this circumstance, the field would, without doubt, have yielded more than one hundred bushels to the acre. If after these, and the still greater report which you will make of Mr. Ruggles' corn, any person doubts that one hundred bushels can be raised on an acre, I hope that the next time I have two hundred and two baskets to pick up and move in one afternoon he may not only "be there to see," but to help do the work, and he will probably be satisfied.

MILTON, November 15, 1854.

Statement of Philemon Ruggles.

The acre of land entered by me for premium was surveyed by Mr. Charles Breck. The land was cultivated in one direction only, the seed having been planted in drills, the kernels dropped six inches apart, alternately on each side. I have found, by several years' experience, that this is a profitable mode of planting, provided you have the same number of stocks as if the seed were planted in hills. The rows run north and south, three and a half feet apart. I cut out the suckers as food for cows. I have not found that cutting the suckers affects the crop materially, unless the corn is very stout, and then it improves the crop by letting in more sun. Some farmers imagine that when the sucker is fully grown its nutriment returns to the main stock, and so to the ear. No experiment has satisfactorily proved this point, any more than that the nutriment which supported a limb returns to the trunk when the limb has decayed. Three-fifths of the acre were in corn last year, the remainder in pease and potatoes. That part which was in corn did as well this year as last. The whole was ploughed in the spring. I spread and ploughed in six cords of common barn-yard manure, made chiefly by cows—then harrowed. After a few days I ploughed again, and let it remain in the furrow, that it might lie more loose than it would be if harrowed after the last ploughing. I put four cords of manure in the drills, two of piggery manure and two of barn-yard, mixed together by shovelling over two or three times. Planted on the 18th and 20th of May, leaving the soil as light as possible over the seed. The seed was soaked three days; and if the corn was sprouted a little, so much the better—it would get up the sooner. Hoed twice—the first time I ploughed, the last time I merely went through with the hoe. I cut the suckers soon after the silk appeared, and the stalks after the corn turned hard. The corn was the variety called smutty white.

Expenses:—

Interest on cost of land,	$9 00	
Taxes,	1 00	
Manure, two-thirds exhausted,	31 67	
Seed,	75	
Drawing and spreading manure,	4 00	
Ploughing and manuring in drills,	8 00	
Planting and hoeing eight days,	10 00	
Cutting suckers and stalks,	5 00	
Husking and getting in fodder,	7 50	
		$76 92

Value of crop:—

One hundred and seventy baskets of corn, each weighing 45 pounds, cobs 6½ pounds, corn 38½ pounds, equal to 116⅞ bushels, at $1,	$116 87½	
Suckers,	8 00	
Two tons of stalks,	15 00	
Two tons of stover and husks,	10 00	
		$149 87½
Subtract cost,		76 92
Profit,		$72 95

MILTON, November 8, 1854.

BRISTOL.

Statement of John B. Newcomb.

The land on which I raised my corn is a dry, loamy soil, somewhat gravelly, and had lain in grass for the last eight years, without any manure, except some droppings from the cattle during the winter season; it did not cut more than eight hundred of hay last season. In April, 1853, carted on about two cords of stable manure, and spread on the most gravelly part. I ploughed the 3d of May, with one of Ruggles, Nourse, and Mason's double ploughs, full eight inches deep, and then carted on about six cords of manure, composed of fifty bushels of leached ashes to four cords of swamp mud; the other two cords were principally loam and swamp mud from the hogpen, after having been worked over by the hogs about one year. The manure was spread evenly over the whole piece, and then harrowed and bushed in; it was then furrowed about three and one-half feet apart, two inches deep, and chained across the furrows, eighteen inches apart. Planted on the 6th and 7th of May, three kernels in a hill. The corn is the eight-rowed yellow, sometimes called the Winneconet corn. Just before the corn came up I bushed it over nicely, which gave me about a week the start of the weeds.

It took about eight quarts of seed to plant the piece. The first week in June, ploughed and hoed. The last week in June, cultivated and hoed the second and last time. Topped the stalks about the 1st of September.

September 30, Mr. Andrew H. Hall came and took out an average rod, and found it to weigh forty-one and three-quarters pounds. Mr. Hall came again in December to measure it. We found it to weigh thirty-three and one-quarter pounds, and measure sixteen quarts and one pint.

Expense of the crop:—

Eight cords of manure,	$20 00	
Carting, spreading, &c.,	4 00	
Ploughing,	3 00	
Harrowing, furrowing, bushing, and chaining,	1 00	
Planting,	1 50	
Seed corn,	25	
Ploughing and hoeing first time,	2 50	
Cultivating and hoeing second time,	2 00	
Topping stalks and harvesting,	6 75	
		$41 00

Value of crop:—

Eighty-two and one-half bushels of corn,	$82 50	
Fodder,	20 00	
		102 50
Profit,		$61 50

Statement of Andrew H. Hall.

The land on which I raised the corn entered by me for premium is a deep, moist loam, situated near the river, and most of it is flowed by high freshets. It was in grass, and cut about one ton of hay to an acre, in 1852. Some years there had been more. May 10, 1853, ploughed seven inches deep, turning the furrows flat; then spread six and one-half cords of manure, and ploughed it in about four inches deep; furrowed one way, (north and south,) making five rows to average one rod in width. In these furrows were put three and one-half cords fine manure, making the hills from fifteen to twenty inches apart; two or three kernels were dropped in a hill, in most hills but two. Used nine quarts of seed; the kind was a large, eight-rowed, yellow corn. Finished planting May 21; about one-eighth was planted a few days before. June 13, I ploughed two furrows in a row, turning them from the corn, and went through the rows twice with a small harrow before hoeing. It was hoed on the 20th and 21st of June, making the land nearly level. Harrowed twice after hoeing, June 25 and July 4. July 21, pulled and dug up weeds three-fourths of a day. Cut the stalks the first week in September; harvested from 15th to 20th of October. The field measured one acre one and a quarter rods.

Before harvesting Mr. Gilmore viewed the corn, and ordered three rows, in different parts of the field, to be saved and measured as an average for the whole. The rows selected were the centre row and eighth from each side, and averaged thirteen rods in length; making thirty-nine rods, or seven and four-fifths rods of land. There were fifty-seven rods of the same average length, and eleven rows six rods long, making eight hundred and seven rods of rows in the field.

The corn from the rows selected was shelled about the middle of December. The ears weighed three hundred and thirty-four pounds; the cobs fifty-one pounds; the corn two hundred and eighty-three pounds. Mr. Benjamin F. Dean saw it measured soon after it was shelled; there were four bushels and three pecks, making ninety-eight and one-fourth bushels on the lot, and ninety-seven and one-half to an acre. If the standard adopted by the State (fifty-six pounds of shelled corn to a bushel) had been used instead of a measure, there would have been one hundred and three and three-fourths bushels instead of ninety-seven and one-half to the acre.

Expenses:—

Ploughing, ...	$3 00
Ten cords of manure, ...	40 00
Carting, spreading, and ploughing in manure,	5 00

Furrowing and planting,	$3 00	
Ploughing and harrowing among the corn,	2 00	
Hoeing,	2 00	
Pulling weeds,	75	
Cutting stalks,	3 00	
Harvesting,	6 00	
Seed corn,	25	
		$65 00

Value of the crop:—

98¼ bushels of corn, at $1,	$98 25	
Corn fodder,	20 00	
		118 25
Whole expense on 161¼ rods of land,		65 00
Profit and use of land,		$53 25

TAUNTON, 1854.

Statement of Samuel S. Pratt.

I hereby certify that Andrew H. Hall measured and marked off in my field of corn one acre. It was greensward in the fall and produced about one thousand pounds of hay. I ploughed the last of November. Three cords of horse manure, put in heaps, was spread the last of April and ploughed in, then furrowed about three feet eight inches each way. Put about two cords of well-mixed hog and privy manure, with loam, in the hill. I planted the yellow, top-over corn, five kernels in a hill, about the 15th of May. Hoed twice; used a cultivator; harvested the 12th of October. Andrew H. Hall cut up one rod; husked, and counted the ears the 10th of October; dried and shelled in December. Measured seventy-seven and one-half bushels per acre.

Expenses:—

Ploughing,	$3 00
Planting and manuring in the hill,	4 00
Hoeing twice,	4 00
Pulling up weeds and cutting stalks,	2 00

Harvesting,	$6 00	
Horse manure, three cords,	19 50	
Two cords of manure put in the hill,	4 00	
		$42 50

Value of the crop :—

77½ bushels of corn,	$77 50	
Top stalks,	7 00	
But stalks, one ton,	7 00	
Pumpkins, two cartloads,	4 00	
One bushel of beans,	2 00	
		97 50
Net profit,		$55 00
Subtract profit on beans and pumpkins,		6 00
Leaving		$49 00

RAYNHAM, 1854.

PLYMOUTH.

Statement of Spencer Leonard, Jr.

Having entered as a competitor for the greatest crop of Indian corn on one acre, I will state that the ground produced a crop of rye last year, and in September the stubble and weeds were ploughed in and sown to rye; and this year, in May, there were nine cords of good stable manure spread and ploughed in with the rye; it was then well harrowed, and planted, May 22, with smutty-white, sometimes called Plymouth County, corn, putting no manure in the hill. I do not think manure applied in the hill, in seasons like the present, of much advantage, and in many of our sandy soils it is a positive injury.

Immediately after planting, a handful of leached ashes was applied on the top of each hill. It was cultivated four times and hoed twice, and about the first of August the weeds were pulled up. The stalks were cut about the middle of September. The seed was selected at the harvesting of my last year's crop, taking the best ears from stalks which bore two or more ears.

Expenses:—

Ploughing and sowing rye, in 1853,	$3 50	
One bushel of rye sown,	1 17	
Ploughing in rye, May 19, 1854,	2 50	
Harrowing and seed corn,	1 50	
Planting,	3 00	
Cultivating four times,	1 00	
Hoeing twice,	6 00	
Pulling weeds,	50	
Cutting stalks,	3 00	
Nine cords of manure, carting and spreading,	45 00	
Ashes, and applying,	7 00	
Harvesting,	7 00	
Interest on land,	4 50	
		$85 67

Income:—

One-half of the manure and ashes still in the ground for the use of future crops,	$26 00	
102 bushels of corn, as measured by the supervisor October 9, at $1,	102 00	
2½ tons of corn fodder, at $8 per ton,	20 00	
		148 00
Net profit,		$62 33

Statement of Ira Conant.

As respects my crop, the ground was rough and somewhat rocky. The expense of ploughing is not commonly more than three dollars and fifty cents per acre. I had four men and four oxen two days ploughing and taking out the stones that were under the surface. The manure spread on the surface was twenty-four horseloads, I think about seven cords; this was made in winter, in my barn cellar, from horses, neat cattle, and shotes, occasionally putting in loam. My ground I ploughed ten inches deep; I then harrowed it, furrowed a good depth, and then put ten loads in the hills of compost manure made the summer previous. The expense of drawing out manure, harrowing, furrowing, and planting, was eight dollars. The corn was planted the 29th of May; the 21st of June I cultivated twice in a row, and had two men commence hoeing; they went over the ground in six hours. July 1, hoed the corn, and the third hoeing was done the 4th of August. The cost of the work, after planting, was nine dollars and fifty cents. The ten loads of compost were ox-cart loads, probably three cords, making in all ten cords. This I could have sold for thirty dollars.

Expenses:—

Manure, ...	$30 00	
Labor in breaking up one and one-eighth acre,	17 50	
		$47 50

Quantity of corn raised, one hundred and one bushels per acre.

Statement of Alonzo P. Benson.

The acre of corn that I enter was planted on sward land, on which last year I cut ten hundred pounds of hay. The quality was inferior, somewhat mixed with meadow. I ploughed on the 15th of May eight inches deep; the soil was black loam, with hard, stiff subsoil. I carted on forty loads of manure, making about eight cords in bulk of manure, which was made from two cows and one horse in a year. It was mixed with sand in about equal parts, which came from under my barn floor in making a cellar under the floorway. The sand was good plastering sand. I spread the forty loads above named on the furrows, then ploughed it in four inches deep, then went over it with a bush; furrowed about three feet, three inches apart; the hills were two feet apart; put in four kernels of corn to the hill, and a shovelful of the same kind of sand that two cows were yarded up on nights for two summers, the solid being taken off every morning.

Hoed the corn twice, ploughing between the rows once in a row the first hoeing, and with cultivator the second time.

Expenses:—

The expense of ploughing first time,	$3 00	
Spreading the manure and second ploughing,	1 25	
Furrowing and bushing,	62	
Carting sand and dropping it in hills,	2 50	
Drawing forty loads,	3 75	
Dropping and covering the corn,	2 00	
First hoeing,	3 00	
Second "	2 50	
Interest on land,	63	
Half a bushel of seed corn,	2 00	
Eight cords of manure,	24 00	
		$45 25

I have charged the labor at ten cents per hour as near as I could.

The kind of corn planted was the smutty white and yellow, mixed. It has been planted in this way for two years before this. I selected the ears in the field before harvesting. Quantity raised, ninety-three bushels per acre.

Statement of George W. Wood.

The acre of land entered by me for premium for Indian corn is a clayey loam. It has been in English grass since 1847; cut in 1853 about three-fourths of a ton of hay. In the winter of 1854 I carted from the manure heap thrown from the barn, where I fed out my corn fodder and fresh hay, the buts and the waste part of the hay, all thrown out together, amounting to twenty loads of manure, and dropped it in loads. The 18th of May I spread the manure and ploughed in. I also spread about half a ton of fresh hay on a part of the acre. Where I spread the hay the corn did not suffer so much as the other part of the piece. After ploughing, harrowed and cultivated until the soil was very fine, and furrowed a little more than three feet apart, dropping twenty loads of fine compost manure in the hill; put the hills two feet apart; the corn was planted on the 19th and 20th of May. Soon after the corn was up I went through with the cultivator, and in the course of the season it was cultivated four times and hoed twice. I went through it the last of July and cut up the weeds, but did not cut the stalks until the corn was nearly ripe. I cannot state precisely the cost of cultivation. I ploughed the ground with one yoke of oxen, about nine inches in depth. I will state the expenses as near as I can:—

Expenses:—

Ploughing,	$2 75	
Harrowing and cultivating,	3 00	
Carting and spreading the manure,	3 00	
Carting and dropping in the hill,	2 50	
Planting, (four kernels in the hill,)	3 50	
Cultivating four times,	1 67	
Hoeing twice,	5 50	
Cutting up weeds,	1 50	
Seed corn,	50	
		$23 82

The corn was the smutty white, or, as some call it, the Whitman corn. Selected the corn at harvest time from the stalks that grew two ears and nearest the ground. The cost of harvesting I make no charge of, as I think the corn fodder is worth as much as the labor of harvesting. Quantity raised, eighty-nine bushels per acre.

Statement of Calvin Leavitt.

The land on which I raised my Indian corn was in grass last summer, and produced about one ton per acre. On the 18th of May I carted on thirty-three loads, of forty cubic feet each, of first-rate stable manure, and ploughed on the 20th, about eight inches deep. It was planted on the 24th and 25th with the Hill, a premium corn, four kernels in a hill, twenty inches apart one way, three feet four inches the other; then ran a cultivator through my corn three times, and hoed twice, the last time on the 15th of July. The extreme dry weather affected my corn very much; I think I am one-quarter short on that account. I raised, as per measurement, eighty-nine bushels and thirty-five pounds per acre.

Expenses:—

Carting manure,	$5 00	
Ploughing and spreading manure,	4 00	
Harrowing, furrowing, and planting,	5 50	
Hoeing and cultivating,	5 00	
Manure,	35 00	
		$54 50

Income:—

89 bushels and 35 pounds of corn, at 90 cents per bushel,	80 53
Profit,	$26 03

I have not made any account of harvesting, as I think the fodder will amply pay for the same. I have not given the corn crop credit for one-half the manure not exhausted, as many do, for it is a great tax on any other crop to find this other half, after raising a hundred bushels of corn per acre.

Statement of Orsamus Littlejohn.

The land on which my acre of corn grew this year is a sandy loam; has been in grass three or four years past, with rather light crops. Owing to the backward spring, and to the distance of the field from the barn, and the greenness of the manure, it was carted on before the ground was ploughed, which is not my usual practice.

May 17, ploughed with two horses, about seven inches deep. May 22, planted four or five kernels in the hill; hills three feet three inches apart each way. The corn did not grow so well as it should at first. The seed is a mixture of the Plymouth County white corn with a yellow that resembles the white in every form except its hard core, which the white lacks. The object in mixing is to get a good core to the white corn. The seed was selected at harvest from small stalks with large ears. Twelve of these ears and buts (the top stalks being cut) weighed twelve pounds fourteen ounces. The ears without the buts weighed ten pounds ten ounces. The crop has been cultivated and hoed three times. It was planted too far apart. The cultivation, charging but half the manure to the crop, cost twenty-five dollars, harvesting included.

MIDDLEBORO', 1854.

Statement of Daniel Alden.

Having entered my name as a competitor for the premium offered by you for the best field of Indian corn of not less than three acres, I now proceed to give an account of my management and expenses. The field upon which the corn grew contains about three and one-fourth acres of land; it was ploughed from greensward in the fall of 1853, it then having been in grass five years, without any manure after it was laid down. The soil is a sandy loam. I commenced drawing manure about the first of May, and drew on thirty-nine cartloads, of thirty-five bushels each, which I put in the hill. I then furrowed it three feet six inches apart, and on the 10th planted it with flesh-colored and yellow corn, putting five kernels in a hill; it was cultivated and weeded out about the 20th of June, and then cultivated twice after.

Expenses:—

Manure, thirty-nine cartloads,	$40 00	
Drawing the same,	7 00	
Ploughing, per acre, $2,	6 50	
One and one-fourth bushels,	1 50	
Planting,	10 00	
Hoeing and cultivating for the season,	10 00	
		$75 00
Deduct half of the expense of the manure for future crops,		20 00
Profit,		$55 00

Statement of Amasa Howard.

Being a candidate for the premium offered for the greatest crop of corn produced on two acres of land, I send a statement of the trial I made.

The land was light and loamy, having been used as a pasture for some years. About the middle of May I drew on forty-six loads of green manure and ploughed it in, then forty-five loads, making ninety-one, dropping it in the hills. Planted it the 23d and 24th of May, three feet one way, and eighteen inches the other, with three kernels in a hill. The 19th and 20th of June it was cultivated and hoed once.

Expenses:—

91 loads of manure, at 75 cents, . . .	$68 25	
Carting, spreading, and ploughing in the same,	12 48	
Planting, ...	5 00	
Cultivating and hoeing, ...	5 00	
		$90 73
Half the manure not exhausted, . . .		34 12
		$56 61

Statement of Horace Collamore.

The two acres entered by me for the premium for the best field of Indian corn was in grass the last year. It is a gravelly loam, rather inclined to clay. About the 10th of May about forty loads of barn manure were carted on, spread, and ploughed under, from seven to nine inches deep, with the Michigan double-mould-board plough, when it was rolled, and forty loads of mud compost carted on and harrowed in.

It was planted the 24th and 25th of May, three and one-half feet one way by eighteen inches the other, three kernels in a hill. About weeding time, a handful of ashes and plaster, mixed, was put round each hill of corn on a part of the field; on other parts super-phosphate of lime and plaster; and on other parts another preparation, which will not be likely to be extensively used, viz., plaster, rotten eggs and ashes; the latter gave evidence of being the best fertilizer; but the drought and worms put an end to my anticipations of even an ordinary crop; and on harvesting, I think it was cut short more than half.

An explanation may be necessary in regard to my new fertilizing agent, viz., rotten eggs and plaster. Late last spring I purchased one hundred and thirty-two boxes, in each of which ten dozen of eggs had been packed in plaster for the California market. An opportunity for shipping them did not offer till the eggs were spoilt. I purchased them for about what the boxes were worth, and as yet have used but a small part; shall experiment another season on various crops.

BROOM CORN.

HAMPSHIRE.

Statement of Avery D. Hubbard.

The land on which my crop of broom corn was raised contains just one acre, and is of a light, sandy soil. In 1852 a crop of corn was raised, of about twenty bushels to the acre. In the fall of the same year it was sown with rye, and had a fair crop of about ten bushels to the acre. No manure of any kind was used on it in 1853. The land is light and mellow, and is easy to cultivate. Ten cartloads of compost manure were spread upon it just before ploughing. The manure was made the winter previous in my hogpen, which is directly under my home barn. It is composed of about two parts of swamp muck to one of horse manure, all thoroughly worked together by the hogs, and did not cost over fifty cents a load, though I have set the price a little higher. I ploughed about the 20th of May, and planted on the 23d with Woodward's improved planter, dropping about one-half bushel of super-phosphate of lime in the hill. The rows were about three feet apart, and the hills two feet apart. The corn was well stocked and very even. The drought affected the crop but little, the land being ploughed deep. The crop was gathered about the last of September, and has been scraped and the seed cleaned up. I have made no account of carting or spreading the manure, as I think it improved the land more than what the manure cost.

Value of crop:—

700 pounds of broom brush, at 10 cents,	$70 00	
52 bushels of broom seed, at 40 cents,	20 80	
		$90 80

Expenses:—

Ploughing and harrowing,	$1 62	
Seed and planting,	1 00	
Phosphate and manure,	9 00	
Interest on the land,	2 40	
Hoeing three times,	4 38	
Harvesting and scraping,	6 50	
Cleaning the seed,	1 50	
		26 40
Net profit on one acre,		$64 40

SUNDERLAND, November 15, 1854.

HAMPDEN.

Statement of Sumner Chapin.

The crop of broom corn which I offer for premium weighed four hundred and seventy-five pounds, grown upon eighty rods of ground. One-half of the land was mown in 1853, and the other half was planted with tobacco, upon which I spread half a cord of manure. In May last I ploughed and planted it with broom corn, without any manure; and I have harvested from it four hundred and seventy-five pounds, worth ten cents per pound.

Value of crop,		$47 50

Expenses:—

Ploughing and harrowing,	$1 50	
Hoeing and harvesting,	10 00	
Scraping,	2 00	
		13 00
Net profit,		$34 00

FRANKLIN.

Statement of Elihu Smith.

The piece of broom corn which I enter for premium, containing one acre and nine rods, is situated in the north meadow of Sunderland, and is a part of five acres which I cultivated in the same manner, as follows:—

The previous fall and winter I drew to the piece twenty cords of muck, which I mixed with five and one-half cords of sheep manure. In April the whole was turned over and mixed, and eighteen bushels of ashes added. About the first of May it was turned the second time, and on the 15th of May was applied to the land by harrowing in. The piece was planted with Woodward's corn planter, and one hundred pounds of super-phosphate of lime put in the hill. The land was cultivated and hoed four times, and yielded, by estimation, eight hundred pounds to the acre. Broom corn had been grown on the land the two previous years.

The crop raised on the acre and one-eighteenth, which I enter, yielded of brush one thousand and twenty-five pounds, and of seed sixty-seven bushels, weighing forty pounds per bushel.

Value of crop:—

1,025 pounds of brush, at 10 cents, . .	$102 50	
67 bushels of seed, at 40 cents, . .	26 80	
		$129 30

Expenses:—

Ploughing, harrowing, and planting, . .	$2 50	
Manure, ...	12 00	
Hoeing, ...	7 00	
Harvesting, scraping and cleaning the seed,	10 00	
Interest on the land, ...	7 00	
		38 50
Net profit, ...		$90 80

Statement of Kelita Hubbard.

The piece of land on which this crop of broom corn was raised contains one acre. Previous to 1853 it had been mown for several years; it was turned over in May of that year and planted with Indian corn, fifteen dollars' worth of compost manure being ploughed in, and a single handful of a mixture of twelve-sixteenths ashes, three-sixteenths lime, and one-sixteenth plaster dropped in the hill. The crop was good, yielding sixty-two bushels of shelled corn to the acre. The land is sandy loam, with a gravelly subsoil, inclined to be wet from springs above—so wet I could not plant until the last of May. In 1854 I manured it in the hill with ten cart bucks of compost manure, worth six dollars, and planted the seed on the manure; hoed three times and harvested about the first of October. I have scraped seven hundred pounds, and think there will be one hundred more.

Value of crop:—

800 pounds, at 10 cents a pound, . .	$80 00	
70 bushels of seed, at 40 cents, . . .	28 00	
		$108 00

Expenses:—

Ploughing and harrowing, ...	$1 50	
Manuring in the hill, ...	2 00	
Seed and planting, ...	2 00	
Hoeing, ...	5 00	
Harvesting and scraping, ...	10 00	
Manure and interest on land, . . .	10 00	
		30 50
Net profit, ...		$77 50

WHEAT.

FRANKLIN.

Statement of D. D. & J. Whittemore, Jr.

We offer for premium a crop of wheat raised in Sunderland on one acre and forty-one rods of land. The soil is a dark, sandy loam. In 1851 the piece was sown with barley and seeded with clover. In 1852 we cut two good crops of clover. In 1853 we ploughed in the second crop of clover and sowed two varieties of wheat, namely, bald and bearded white Flint, one bushel of the first, and one and one-half of the latter, harrowed well, and in the spring sowed on the piece three bushels of salt, two bushels of plaster, and five barrels of slaked oyster-shell lime.

Our wheat suffered from the severe winter and from drought. We judged that full forty per cent. of the winter wheat was killed. We harvested in July, and for want of barn room had it threshed immediately with a flail; consequently a large per cent., estimated at from three to five bushels, remained in the straw. Of the bearded we had nineteen bushels; of the bald we had six; giving us twenty-five bushels of clean wheat free from all other seeds.

Value of the crop:—

25 bushels of wheat, sold at $2.50, . .	$62 50	
Straw, valued at	7 00	
		$69 50

Expenses of cultivation:—

Ploughing, sowing, and harrowing, . .	$3 75	
Paid for seed wheat, ...	3 37	
Lime, salt, plaster, and appliance, . . .	5 35	
Harvesting and threshing, ...	8 00	
Interest on land, ...	5 00	
		25 47
Net gain, ...		$44 03

We will also say to the committee, that there is on the ground on which this wheat was raised an orchard of apple trees of nine years' growth.

BERKSHIRE.

From the Report of the Committee.

But one crop of winter wheat was entered, and that hardly worth a premium. The wheat was sown, after corn, the last of September; two and one-fourth bushels of blue stem were sown to the acre, and one bushel of plaster sown with the seed; it was ploughed six inches deep and harrowed three times. This field was highly manured last year, and produced about eighty bushels of corn to the acre. Mr. Curtis informed the committee that it produced about fifteen bushels of wheat to the acre. A part of the field was badly winter-killed, and that saved it from the ravages of the insect, the part that did not winter-kill being nearly destroyed by its ravages. As this is so uncertain a crop, and is raised in so small a section of the county, and by so few persons, your committee doubt the propriety of the society's encouraging its cultivation.

There were fifteen entries of spring wheat, and decidedly the best was that of Mr. Jason Clapp, of Pittsfield, which would have taken the first premium if it had been entered in accordance with the regulations of the society.

Mr. Coman's wheat, for which the first premium is awarded, was on ground that received about twenty-five loads of compost from the hog yard last year, and produced seventy-five bushels of corn to the acre. For the present crop no manure was used. It was ploughed seven inches deep, harrowed, and the seed ploughed in. Two and one-fourth bushels of Mediterranean wheat were soaked in brine over night and rolled in lime and then sown.

Mr. Hinckley's wheat, for which the second premium was awarded, was on ground that received twenty loads of long manure ploughed in, and ten loads of compost spread on and harrowed in last year, and produced one hundred bushels of corn to the acre. This year it was ploughed once six inches deep, and sown, 13th of May, with two and one-fourth bushels of Mediterranean wheat to the acre.

Mr. Tyrrell's crop, on which the third premium was awarded, was sown after corn that received twenty-five loads of hog and compost manure to the acre last year, and produced eighty bushels per acre. This season it was ploughed twice, seven inches deep; sown 5th of May, two bushels of Mediterranean wheat, and three pecks of plaster, per acre, being used.

Mr. Richard's wheat, which received the fourth premium, was on greensward ploughed last fall. Seven loads of long manure ploughed in this season; sown 10th of May; two bushels of Italian wheat per acre.

We saw fine fields of spring wheat in every section of the county we visited; and, so far as our observation extended, it had escaped the ravages of the insect with a single exception—that of Mr. Russell, of Pittsfield.

PLYMOUTH.

Statement of Joseph Kingman.

The ground on which my wheat grew, for which I entered a claim as one of the competitors for the society's premium, contains one acre and twelve rods, as surveyed by Mr. Copeland. It is high, warm land—a sandy loam. It had been planted the two years previous—the first to corn, the next to potatoes.

The 15th of September I sowed five pecks of the white Flint wheat. I put on twenty bushels of ashes and three loads of compost manure on the poorest part of the lot at the time of sowing. I had manured the land for each of the previous crops with about twenty ox-cart loads from my barn yard.

My wheat stood the winter well, and looked finely in the spring and first part of summer. It suffered very much from the drought of July, and a portion of it somewhat from blight or rust on the straw. These two causes, I think, reduced the amount of wheat one-fourth or more; but, notwithstanding, I had twenty and one-fourth bushels of handsome wheat. I would remark, that I was unable to get it threshed until the 22d of September. Had it been threshed immediately after harvesting, I should probably have had another bushel, as the fowls devoured some of it.

I threshed out nine pecks for sowing before the machine arrived. The remaining eighteen bushels were threshed by Mr. Killbrick, of Pembroke, whose machine for threshing grain of all kinds is the most perfect I have ever seen.

RYE.

HAMPSHIRE.

Statement of George Dickinson.

The land on which my crop of rye grew is of the second quality of meadow land, lying directly on the bank of the Connecticut, in Hadley. In the spring of 1853 it was ploughed from seven to eight inches deep. Twelve loads of manure were applied to the acre and harrowed in. Corn was then planted and thoroughly cultivated. The corn was cut up the second week in September, and yielded at harvest fifty bushels per acre. The ground was again ploughed from eight to nine inches deep, and sown with a bushel and a half of white rye per acre, at seventy-five cents per bushel. The crop was harvested the 13th and 14th of July.

Value of crop:—

Sixty-five and a half bushels of fifty-six pounds,	$76 63	
Three and a quarter tons of straw, . .	19 50	
		$96 13

Expenses:—

Ploughing and sowing, ...	$3 00
Three bushels of rye, ...	2 25
Harvesting and housing, ...	5 00

Threshing and cleaning,	$6 00	
Interest and taxes,	15 00	
		$31 25
Net profit,		$64 88

Hadley, November, 1854.

Statement of Chester Cowles.

The land on which this crop was raised contains two acres. In 1853 it was planted with corn, and manured at the rate of twenty loads to the acre, spread on and harrowed in. After my corn was harvested I sowed my rye, at the rate of one bushel to the acre. I harvested in July. The land was ploughed deep and thoroughly harrowed.

Value of crop:—

50 bushels, at $1.25,	$62 50	
Straw, by estimate,	15 48	
		$77 98

Expenses:—

Seed,	$2 25	
Ploughing, harrowing, and sowing,	3 50	
Harvesting and threshing,	8 00	
Interest on land,	12 00	
		25 75
Net profit,		$52 23

PLYMOUTH.

Statement of Nahum Snell.

The land on which I raised the rye which I entered as a competitor for the society's premium consists of gravelly loam, rather uneven, on which was rye in the year 1853; it was sown to rye in September, 1853, the second year, on which I carted fifty loads of compost manure, consisting of about one-half meadow muck, and sowed two bushels of rye upon one acre two quarters and thirty rods of land, according to the certificate of the surveyor, on which I raised forty-nine and a half bushels of good rye, threshed in August

Statement of Spencer Leonard, Jr.

Having entered as a competitor for the premium offered for the best experiment in raising rye, I will state that the land on which it grew has a warm, light, sandy soil, and has been in grass three years, producing the last year about half a ton. It was ploughed in August, and the rye was sown in September. One hundred bushels of ashes were spread broadcast, and on one-half acre of it about one hundred pounds of guano; and on one-quarter of an acre eight loads of mud, or muck, which had been exposed to atmospheric influences for two or three years, were spread; the other quarter being a better quality of soil, nothing was applied but the ashes; it was then all well harrowed and rolled.

Expenses:—

Ploughing,	$2 00
Ashes, and applying,	15 00
Muck, " "	1 50
Guano, " "	3 50
Harrowing and rolling,	1 50
Harvesting,	5 00
Threshing and cleaning,	5 50
Interest on the land,	2 00
	$36 00

Income:—

26 bushels rye, at $1.25 per bushel,	32 50
1 ton of straw, at $10 per ton,	10 00
One-half the ashes not consumed,	7 50
	$50 00

BARLEY.

BERKSHIRE.

From the Report of the Committee.

This crop is raised quite extensively in the north and middle sections of the county, and the soil seems to be well adapted to its growth. It requires a strong, moist soil. We gave Seymour Wilcox, of Lanesboro', the first premium; B. F. Mills, of Williamstown, the second; Ansel Prince, of Windsor, the third; and Joshua Tillotson, of Lanesboro', the fourth. Mr. Wilcox's field contains twenty acres; it was in corn last year, and had a top-dressing of ten loads of manure per acre; no manure used on the present crop; it was ploughed seven inches, the seed rolled in plaster, and sown, 18th of May, with three bushels of six-rowed barley per acre; seed raised in Wisconsin. Mr. Wilcox has been in the practice of raising barley a number of years, and thinks that seed from the west produces a better crop than seed raised here. Mr. Mill's ground was in corn last year; it received twenty-five loads of manure to the acre, and produced sixty bushels of corn per acre. For the present crop it was ploughed seven inches, and three and one-half bushels of six-rowed barley were sown on the 13th of May, and on the 30th of June, two hundred pounds of plaster. Mr. Prince's barley followed potatoes; twenty loads of manure were used last year, and twelve this; it was ploughed six inches, and sown 22d of May, with three bushels of six-rowed barley.

BRISTOL.

Statement of George R. Leonard.

On the last of April, 1853, I ploughed one acre of ground, on which I raised, the year previous, one hundred and fourteen bushels of corn. On the 20th of May I spread three cords of stable manure, and cross-ploughed in the same. On the 21st of May I sowed three bushels of barley, which I harrowed and bushed in.

I weighed the crop after cutting and drying four days, and had five tons thirteen hundred and sixty pounds. I threshed said crop of barley the last of December and first of January, and measured forty-seven and one-fourth bushels from the same. The lodging of the barley before cutting, together with the trampling and pecking of the fowls, probably destroyed a number of bushels of the crop.

Expenses:—

Charged for two ploughings, ...	$2 00	
Three cords of manure, ...	12 00	
Drawing on and spreading manure, . .	1 06	
Sowing, harrowing, and bushing, . . .	1 90	
Three bushels of barley, ...	2 25	
Harvesting, ...	3 04	
Threshing and winnowing, ...	5 20	
		$27 45

Income:—

47¼ bushels of barley, at $1 per bushel, .	$47 25	
Straw, after threshing, ...	32 00	
		79 25
Balance in favor of crop, . . .		$51 80

NORTON, 1854.

PLYMOUTH.

Statement of Spencer Leonard, Jr.

The acre of land on which I made an experiment in raising barley has a loamy soil, of good quality; it was planted to corn last year. It was ploughed the last of April, this year, and on the 10th of May the barley was sown and well harrowed. There were two hundred pounds of Peruvian guano, well mixed with soil and charcoal dust, sown broadcast before the last harrowing; the ground was then rolled. The barley was cut and housed in July, and the 9th of October it was threshed, and measured thirty-six bushels.

Expenses:—		
Three bushels of barley sown, at 90 cents,	$2 70	
Guano, and applying,	6 75	
Ploughing,	2 00	
Sowing and harrowing,	1 40	
Rolling,	25	
Cutting and getting in,	2 75	
Threshing and cleaning,	4 75	
Interest on land,	6 00	
		$26 60
Income:—		
36 bushels of barley, at 90 cents,	$32 40	
One and one-fourth tons of straw,	10 00	
		42 40
Net profit,		$15 80

The guano caused a very luxuriant growth of straw, some of it measuring more than four feet high; but the grain was not equal to the straw, as some of it fell before ripening.

OATS.

WORCESTER NORTH.

From the Report of the Committee.

The specimen of oats exhibited was raised by Mr. Charles Flagg, of Sterling, being fifty-seven bushels per acre, and weighing thirty-two pounds to the bushel. The whole expense of cultivation, including seed, he estimates at fourteen dollars; the fifty-seven bushels of oats, at fifty-five cents per bushel, would amount to thirty-one dollars and thirty-five cents; deduct the fourteen dollars for cultivation, and you have left the sum of seventeen dollars and thirty-five cents, not including the value of straw, which he did not estimate, nor did he charge for manure applied the previous year. And your committee award to him the first premium.

EDWIN UPTON, *Chairman.*

HAMPSHIRE.

Statement of Albert Montague.

The acre of land on which I raised my crop of oats is a sandy loam. I have planted it for two years previous—the first year upon turf, manuring in the hill. Last year I ploughed in twenty loads of green manure and put a little compost in the hill. My land was not in condition to plough for spring grain as early by fifteen days as the average of seasons. The crop was not as good as it would have been had the land been in condition to sow as early as usual. I ploughed my land and sowed my oats on the 10th of May. I sowed four bushels to the acre. Unless sown very thick, my oats are apt to fall down. I harrowed thoroughly, and then rolled them with a heavy roller. I harvested the 29th and 31st of July, and threshed in September, and had sixty and one-half bushels. I cut them when they were about one-half white.

Value of the crop:—

60½ bushels of oats,	30 25	
1½ tons of straw,	9 00	
		$39 25

Expenses:—

Ploughing and sowing,	$2 00	
Seed,	2 00	
Harvesting and threshing,	4 50	
Interest on land,	4 50	
		13 00
Net profit,		$26 25

SUNDERLAND, November 1, 1854.

PLYMOUTH.

Statement of Daniel Alden.

The land on which I raised the crop of oats entered by me for a premium is a sandy loam; in 1852 it was in grass; in May, 1853, it was ploughed with the Michigan plough, nine to ten inches deep; then I applied seventy-five loads of good compost manure to the acre, and planted it to corn. In the fall of 1853 I cross-ploughed it. April, 1854, ploughed the ground; then harrowed, and sowed three bushels of seed, which came from the westerly part of New York some three years ago. Sowed the oats the 20th of April; then harrowed and rolled the ground; I cut the oats the last of July, and in September threshed and cleaned them with a machine.

Income:—		
63¼ bushels of good clean oats, at 67 cents, .	$42 37	
1½ tons of straw, at $8 per ton, . . .	12 00	
		$54 37
Expenses:—		
Ploughing, ...	$2 00	
Harrowing and rolling, ...	1 50	
Three bushels of oats, at 67 cents per bushel,	2 00	
Cradling, ...	1 25	
Raking, binding, and getting in oats, . .	1 50	
Threshing and cleaning oats, . . .	6 00	
		14 25
Net profit, ...		$40 12

GRASS SEED.

HAMPSHIRE.

Statement of Oliver Williams.

I have raised, the past season, two bushels of herds grass seed on thirty-five rods of ground. A sample of the seed I had on exhibition at the late fair. The land on which the seed grew was a light loam. This piece was selected from three acres, which, in 1852, were sown with rye and oats, my usual spring grain. The field—aside from these thirty-five rods—

was cut about the 7th of July, the remainder about the 1st of August. I consider the hay, after threshing off the seed, worth about half price. I recommend to all farmers to raise their own grass seed. My yield was worth at the rate of twenty-four dollars to the acre.

Value of the crop:—

Two bushels of seed, at $3,	$6 00	
Hay,	2 00	
		$8 00

Expenses:—

Grass seed,	$0 50	
Ploughing and harrowing,	76	
Interest on land, at $50,	75	
Cutting and threshing,	1 00	
		3 00
Net profit,		$5 00

SUNDERLAND, October 16, 1854.

FRANKLIN.

Statement of O. & F. H. Williams.

The piece of ground on which we raised two bushels of herds grass seed contains thirty-five rods. The piece had been down to grass two years. Soil of a sandy loam, and not in a high state of cultivation. At the rate which we have received on thirty-five rods this year, one acre would produce nine bushels of seed.

Expenses:—

Ploughing,	$0 50	
Sowing,	50	
Seed,	25	
Harvesting,	1 00	
		$2 00

Income:—

Two bushels of seed, ...	$6 00
Profit, ...	$4 00

SUNDERLAND, 1854.

BEANS.

BRISTOL.

Statement of Samuel Carpenter.

I hereby present a claim for a premium for the best crop of white beans, raised on forty-one rods of ground the last season. The land the year preceding the spring of 1853 was a pasture. It was plain land, of a light and sandy soil, and had not been ploughed for about fifteen years previous. I first ploughed it in September, 1852, turned the sward at that time, and let it so remain till the next spring, (1853;) then harrowed it all over thoroughly with a horse harrow. I then spread on two cords of manure, mostly from the barn yard, with scrapings around the door yard, not very rich, and then ploughed the ground once with a light horse plough, covering the manure. I then furrowed it one way less than three feet wide, and the last of May planted the beans in hills about a foot apart in the furrows, using four quarts of seed.

After the plants had been up a few weeks I cultivated between the rows with the common cultivator, and hoed them once thoroughly, taking care to kill all the weeds. This was all I did to them till they were harvested, having been allowed to stand till they were ripe.

The expense of cultivation (not including the value of the manure) was, as near as can be ascertained, (the ground having been ploughed in connection with adjoining land,) $5.25.

The quantity raised was six bushels two and a half quarts of good beans, a sample of which is herewith exhibited.

Statement of John B. Newcomb.

The land on which I raised my beans is a very light soil, and has been in pasture for the last seven years. In the fall of 1852 I ploughed it up, when scouring ploughs for cattle show. In May, 1853, I carted on something less than a cord of manure, composed of the following ingredients: One cartload of stuff from the hen roost, one load from under the stable floor, and one load of mud and ashes.

May 28 I furrowed it out three feet apart and dropped the manure in the furrows. Planted one foot apart, four beans in a hill. Cultivated and hoed them about the middle of June. October 3 I harvested the crop, and found it to measure four and three-quarters bushels.

Value of the crop:—

Four and three-quarters bushels, ...		$9 50
Expense of the crop:—		
Manure and carting, ...	$3 00	
Furrowing and planting, ...	50	
Cultivating and hoeing, ...	50	
Harvesting, ...	50	
Seed beans, ...	25	
		4 75
Profit, ...		$4 75

PLYMOUTH.

Statement of Horace Collamore.

The half acre entered for premium on white beans was of gravelly loam, "high and dry;" it was planted with potatoes the last year. About eight loads of compost manure, mixed with about thirty bushels of leached ashes, were carted on the last of May and ploughed in and harrowed. The beans were planted on the first day of June, two and a half feet one way by fifteen inches the other, six beans in a hill; a handful of ashes and plaster mixed was put in each hill on about three-quarters of the lot; on the other part a less quantity of "Coe's super-phosphate of lime" and plaster.

The beans came up well, and were remarkably vigorous till the drought commenced, when they suffered severely; it probably lessened the crop more than one-third. That section dressed with super-phosphate of lime was evidently the best.

This is the only crop on which the beneficial influence of phosphate of lime has been equal to ashes and plaster, and I have tried it on nearly all my crops the present season.

Statement of Abiel Bassett.

The quarter of an acre of land on which I raised the crop of white beans entered by me for premium is a light, sandy soil. The first of May we hauled on ten loads of compost manure and ploughed and harrowed the ground. May 22 the ground was furrowed, two feet between furrows, and planted with white beans; the beans were cultivated once and hoed; it being a light loam, it was affected by the drought. October 2 the beans were threshed and cleaned, and measured four bushels and a half.

MIXED CROPS.

NORFOLK.

Statement of Cheever Newhall.

In order to ascertain whether or not Indian corn and cabbages could be grown together in alternate rows profitably, I selected what I supposed to be one acre of good clayey loam, which had been in grass seven years, and had been mown and pastured every year. This was ploughed in the month of May, nine inches deep, with a Michigan plough; eight loads of night soil, after being thoroughly mixed with about four cords of loam from the same field, were spread evenly over the surface and well harrowed in. On the 1st day of June the land was marked out with a plough exactly six feet apart, and cabbages set in the furrows two feet apart; three or four days afterwards corn was planted between each row of cabbages, in hills twenty-two inches apart, five or or six kernels in a hill; at the first hoeing it was thinned out, leaving four stalks in each hill. Both the cabbages and corn were hoed twice only.

The cabbages were marketed in September and October, and sold for one hundred and fifteen dollars.

In the month of August twelve barrels of the corn were gathered green and sold in Boston for fifteen dollars; the remainder of the crop was cut up near the ground about the 15th of September, and shocked upon the field. The first week in October it was husked, and produced eighty-eight baskets of corn on the ear. On the 11th of November one basket was shelled, and weighed thirty-eight and one-half pounds, making three thousand three hundred and eighty-eight pounds, which, divided by fifty-six pounds, the standard for a bushel, give sixty and one-half bushels, which, together with the twelve barrels sold green, supposed to be equal to one and one-quarter baskets of ears to each barrel, or fifteen baskets of thirty-eight and one-half pounds each of shelled corn, making five hundred and seventy-seven pounds of corn, which divided by fifty-six, give ten and one-quarter bushels, or seventy and three-fourths bushels on thirty-eight thousand four hundred and eighty-four square feet of land, being a fraction over eighty bushels per acre, or more properly a half acre, as the corn occupied but one-half of the land.

Since the crops have been taken off, the land has been surveyed.

Expenses:—

Ploughing the land, ...	$7 00
Eight loads of night soil, ...	24 00
Composting, carting out, spreading, and harrowing, ...	16 00
Planting corn, ...	2 50
Setting out cabbage plants, ...	3 00

Cost of cabbage plants and seed corn, . .	$3 37	
Marking out, ...	75	
Cultivating and hoeing twice, . . .	10 00	
Cutting up and housing corn, . . .	4 00	
Husking corn, ...	4 00	
Marketing cabbages and green corn, . .	21 67	
Interest on land, ...	18 00	
Taxes, ...	1 50	
		$115 79
Value of crop :—		
Sixty and one-half bushels of corn, . .	$60 50	
Twelve barrels of corn sold green, . .	15 00	
Corn fodder, ...	15 00	
2,476 cabbages, ...	115 00	
		205 50
		115 79
Net profit on $141\frac{1}{3}$ rods, . .		$89 71

Dorchester, November 13, 1854.

ROOT CROPS.

ESSEX.

From an Address by R. S. Fay, Esq.

I propose to call your attention to the growth of roots, as an indispensable part of every good system of cultivation. This is very much neglected by us, although much of our soil is extremely well calculated to produce them. A neighbor of the late Daniel Webster, who was certainly one of the best farmers New England has ever produced, once applied to him to know how he should proceed to improve his farm, which, as he said, without doubt very truly, "was pretty much run out;" that is to say, it had been cropped without system and without manure until nothing would grow upon it, while side by side were the luxuriant fields of Mr. Webster. His reply was, "Grow turnips." This laconic answer neither edified nor satisfied the querist. He wanted to know what wonderful virtue there could be in a turnip which was to work such remarkable changes on his farm, only knowing the vegetable to be a very good accompaniment to a leg of boiled mutton, or a tolerable addition to a broth. He asked, therefore, naturally enough, what growing turnips had to do with making his farm more porductive. Mr. Webster replied, that he had not then time to go into the matter, as it would embrace the whole science of farming. He could only say this: To grow turnips, the land must be well ploughed, highly manured, and kept free from weeds. It was a crop which, in a proper rotation, prepared the land in the best manner for those which follow it; more than this, it would do well on his light loams, although perhaps better adapted for a heavier soil. Its yield was large and bulky; and to dispose of it to the best advantage, it ought to be fed off the farm to the cattle during the winter. To do this he would be forced to increase his stock; and in this way he would augment his barn-yard manure, which in its turn would add to the fertility of his soil. He would have better cattle, better and more pigs; and if he kept a few sheep, as every farmer should do, his lambs would come earlier to market, and would be in good condition and command high prices, instead of being sold for their pelts.

This recommendation to grow turnips must not exclude, nor was it intended to do so, the cultivation of other roots. Beets and carrots, for some lands, are more profitable than turnips, besides being better food for milch cows. Every farmer can soon learn by experience which root thrives best on his land; and having learned this, he will be blind to his own interest if he does not cultivate it. In England and Scotland the turnip takes precedence of all other roots; and, from being originally cultivated as the best fallow crop before wheat, rather than from its intrinsic value, it is now the most important one grown.* A leading English agriculturist has said, I believe with perfect truth, that the failure of the turnip crop in that country would be a heavier blow to its prosperity than the failure of the Bank of England. It is owing principally to the liberal use of the turnip that English cattle and sheep have reached their present high state of perfection, making the land support four times the number that could be maintained under the old system of hay and pasture feeding. If we should adopt their practice in this respect, there is no reason why we should go abroad to purchase, at enormous prices, animals which in all essential qualities are no better than, if as good as, our native stock.

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* In Haddingtonshire, Scotland, in 1853, one-sixth of the entire arable land was in turnips, exceeding the number of acres in wheat, which is the money crop, by nearly one thousand acres.

There is a reason for extending the cultivation of the turnip which no farmer who has felt and witnessed the present summer's drought will think lightly of. Our climate is one of vicissitudes, more extreme in their character than any other under the sun. The old saying, that "it never rains but it pours," is strictly true of New England. It is either a deluge here or a drought; and the most weatherwise of us cannot truly foretell what the coming month shall bring in the way of heat or cold, sunshine or rain. We are tolerably certain, however, of one thing, that a "dry time may be expected" during the summer. It is therefore important that we should vary our crops as much as possible, so that the periods of their planting and maturing may run through the entire season. The fate of the hay crop is pretty well settled before the turnip is even planted, and a drought that may cut short our maize may pass away in season to give us a good field of turnips. We may thus have something to hope for in them long after we despair of every thing else.

The value of turnips as food for cattle and sheep, compared with other vegetable products, has been ascertained by a series of well-conducted experiments in feeding, the correctness of which chemical analysis has fully confirmed. One pound of hay of the best quality is about equal to five pounds of turnips; and as twenty tons of the latter may be easily grown to the acre, it will be seen that we have the power to increase very materially the nutritive products of the soil by the cultivation of this root, leaving the land in better condition than after any other crop. For it must be borne in mind that the turnip, when it has been brought into leaf, takes a great portion of its nutriment from the atmosphere, leaving a large part of the manure which has been necessarily applied to it to force its early growth for the crop that shall follow. The expense of cultivation need be no greater than for any crop of half its value, if proper drills and horse hoes are used;* and there is nothing which repays the care and attention bestowed upon it so well. The advantage to the farmer by the cultivation of roots has been briefly but exceedingly well stated in the Report of the Secretary of the Board of Agriculture for the present year,† while at the same time we learn from it how completely it is neglected. The smallness of the prizes offered by our agricultural societies for root crops is also another indication of the little attention that is given to them.‡

It follows of necessity, almost, that if we increase the cultivation of roots we shall likewise add to our stock of cattle and sheep, with a view to the most profitable disposition of them. Under our present system, where we rely entirely upon our pastures in summer, and on hay and corn fodder in winter, to keep our stock, it not unfrequently happens that a failure in either, forces farmers to reduce it at the most unpropitious moment, on account of its poor condition and the low state of the markets caused by the general necessity for selling. If we manage, however, a little differently, sowing a few acres of corn for fodder, and a still larger number in roots, beyond what is needed for our usual stock, we shall then be in a position to take advantage of the improvidence or want of foresight in others, by buying cheap what they are forced to sell, and fattening them for the butcher with the surplus product of our farms. This is the true test of success; and when one is in a position to do this, he is on the sure road to wealth and prosperity. The reply of an intelligent Scotch farmer on my remarking upon the great breadth of land he had in turnips is as true here in its application as it is in Scotland. It was this: If I did not cultivate at least one-sixth of my farm in turnips, fattening stock upon them in the winter to be sold in the spring, and purchasing bones, guano, and other fertilizers to bring the land to the highest condition for their cultivation, I could neither farm to a profit nor pay my rent.

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* Turnips are sown in England by a drill drawn by horse power, sowing several rows at the same time, and manuring by the same operation. After they have come into the rough leaf they are horse hoed, the machine used being worked by one horse, the wheels running the same width as those for the drill machine, and hoeing perfectly the same number of drills. The same instrument can be widened or narrowed to work across the drills, cutting out the plants at equal distances, so that nothing more is required to be done by hand than pick out the few plants left too close together after the cross hoeing. This instrument works so accurately that it is used between the rows of drilled wheat, barley, rye, and oats. It will weed thoroughly eight or ten acres in a day, and is drawn by one horse, and attended by one man, with a boy to lead the horse. With these two machines twelve acres of turnips, at least, can be cultivated at an expense of labor not much greater than we should be forced to apply to one, in order to have the work as well done. The same machines can be altered to sow corn and to hoe it, or any other kind of grain or seed.

† There is an evident misprint or omission in the valuable Report of the Secretary of the Board of Agriculture at page 37. It reads, "Nearly three millions of acres (in England) are annually appropriated to the turnip crop, and the annual value of this crop amounts to nearly two millions." It should probably read two hundred millions.

‡ The prizes awarded for crops in Massachusetts for 1853 amounted to two thousand seven hundred and eighty-four dollars and sixteen cents, of which turnips received thirteen dollars and fifty cents.

From the Report of the Committee.

Previous to speaking of the particular statements, the committee ask leave to say that there exists an inexcusable degree of looseness in relation to the principles to be regarded in making these awards. The committee are unable to find any definite regulation as to the time of making entries of these claims. It has been usual to give notice of such claims to the secretary early in the season, that the committee may have an opportunity to view the crops when on the ground; but this practice has not always prevailed, less the present season than before, for the committee had no knowledge of these entries until the statements came to their hands on the 15th of November; consequently their judgment must be based upon the statements themselves, or upon information otherwise obtained.

The statements of the extraordinary products on the farm of Mr. Brown, of Marblehead, are truly astonishing. They go so far beyond any thing of the kind ever before brought to the knowledge of your committee that they could not at first credit them entirely. A particular examination of the facts by some of your committee, who went upon the ground, has resulted in the conviction that, if the mode of measurement adopted by Mr. Brown can be approved, his statements may be credited. The certificate of the foreman on the farm is attached, who probably knew much better than Mr. Brown himself, who is not presumed to have had any hand in the growing or measuring of the crops. The general mode of measurement adopted was, to select a small parcel of land presumed to contain an average of the field, ascertain the exact quantity grown on this space, and then compute the entire field as yielding accordingly. As, for instance, four rods of a field of onions were found to have yielded twenty-five bushels; then eighty rods, or half an acre, would be taken to have yielded five hundred, more or less, as the fact may be. This will do, if the parcel to average is judiciously selected; but who is to judge of this? Surely not the claimant or his hired laborers; nothing less than persons of experience in such matters entirely free from bias. This consideration applies with full force to the several statements presented by Mr. Brown. The committee have felt it due to truth and propriety to present this matter distinctly, that it may be passed on at the present time, and that a rule may be established for future guidance. The committee have no reason to believe that Mr. Brown intended to mislead their judgment as to his crops; still they think his standard of measure altogether too loose to be relied on. In the opinion of the committee, "*averages are at best but guesses;*" and they think very few claimants will guess against their own interest.

> "Where self the wavering balance shakes,
> It's rarely right adjusted."

Mr. Brown's crops were as follows:—

Squashes.—Thirteen and one-half tons to the acre, of a kind called *marketable,* by which we understand a kind that would sell—supposed to be a mixture of the marrow with the African, growing much larger than the genuine marrow, but not of so good quality. This was a large produce indeed—larger than your committee ever knew of the marrow. Of the value of this variety the committee have no definite knowledge, and therefore do not think proper to award it a premium.

Cabbages.—Four thousand four hundred heads to the acre, using about ten square feet to each plant, many of which weighed twenty pounds and upwards. This was indeed a mammoth crop; it was seen by the committee, and in their opinion was well entitled to the premium of six dollars.

Turnips.—Blue Swedish, a handsome variety and fine growth; yield thirteen tons and more to the half acre. These were seen by the committee, and in their opinion are well entitled to the premium of six dollars.

Carrots.—Estimated to be more than thirty-four tons to the acre. They were indeed a magnificent crop; but how many there were, the committee have no satisfactory means of determining, as when last seen most of them were in the ground. They cannot, therefore, recommend the award of a premium for this crop.

Onions.—These were shown to the committee in a pile in the barn; they were large and fair. The committee do not doubt that a few rods were found yielding in proportion as stated by Mr. Brown; but that a half acre was so found together they cannot credit, with their recollection of the appearance of the field.

Potatoes.—Two hundred and sixty bushels from nine and a half bushels of seed, was indeed a fine crop; how much land they grew upon, the committee have no satisfactory means of determining. But as this is the only crop of potatoes reported for years, they recommend that the premium of six dollars be awarded to it.

The committee recommend that Mr. Brown's statement be published in full, that he may be heard for himself. They have felt constrained to remark upon some features of it, that Mr. Brown and others hereafter may make their statements more explicit. Mr. Brown knows very well how to do this.

The committee received from Benjamin Huntington, of Danvers, a statement of the produce of half an acre of onions—three hundred and eighty bushels, a part of a field of one and three-quarters acres, which they think deserving the premium of six dollars, and award it accordingly. The committee received from James Manning, of Hamilton, a statement of his crop of carrots, for which they award a gratuity of six dollars.

The committee have much more to say on the culture and measurement of root crops, but forbear to say it, lest by many words they should give offence where none is intended.

J. W. Proctor, *Chairman.*

Statement of Ephraim Brown.

I herewith submit a statement of the following crops, which I enter for premium, viz.: One acre of squashes; one acre of drum-head cabbages; one-half acre of ruta-baga turnips; one-half acre of carrots; and about one acre of black Chenango potatoes. Specimens of the first four of the above-named crops were exhibited at the fair at Lawrence.

1st. The land on which the squashes were planted was broken up last fall, manured in the spring with a liberal dressing of rotten kelp, spread on and ploughed in by cross-ploughing the land. The squashes were planted the 25th of May, eight feet apart each way, with two small shovelfuls of old barn manure in the hill. The bugs were not so numerous on my squashes this year as usual, although I was somewhat troubled with them. The method I adopt to keep them off is the use of air-slaked lime and ground plaster, sifted on the plants till they are large enough to be out of the way of insects. I place five seeds in the hill, and leave three plants at the last hoeing. I commenced gathering for market the middle of August, and finished the last of September. Yield, thirteen and one-half tons of good marketable squashes.

2d. The ground on which the cabbages were raised has been planted with onions the last six years, and has been well manured with rotten kelp and compost manure each year. This year I gave it a good dressing of rotten kelp; ploughed it in and manured in the hill with a small shovelful of old barn manure; planted the seed in the hill on the 25th of April, and commenced cutting for market the 9th of August. Marketed four thousand four hundred heads.

3d. The land on which the turnips were raised was broken up last June, and manured with a very heavy dressing of kelp and green barn manure, about ten cords per acre spread on the grass and turned under the sod. The ground was then harrowed and cultivated well, so as to make a surface of fine soil before planting. The seed was sown the 28th of June, with the drill, in rows three feet apart, and the plants left standing in the rows one foot apart. The crop was gathered and housed on the 9th of November. Yield, four hundred and sixty-two bushels, weighing sixty pounds per bushel.

4th. The ground on which the onions were raised was broken up in the spring of 1851 and planted with cabbages; in 1852 planted with squashes; in 1853 planted with carrots. It was manured liberally each year with barn manure and rotten kelp, about eight or ten cords per acre. This year I put on about twelve cords per acre. Sowed the onions the twelfth of May. Yield on half an acre, five hundred thirty-seven and a half bushels, weighing fifty pounds per bushel.

5th. The land on which the carrots were raised was also broken up in the spring of 1851; planted then with ruta-baga turnips; in 1852 with squashes; in 1853 with ruta-baga turnips; and manured each year about as the onion land spoken of above. This year it was manured with rotten kelp and green barn manure, (by which I mean barn droppings,) from ten to twelve cords per acre. Planted the 31st of May. Yield, thirty-four thousand nine hundred and seventy-four pounds, or six hundred and thirty-five bushels and forty-nine pounds.

6th. The land on which the potatoes were raised was not all in one field, a small part of the seed being planted in two rows around the sides of another field. I am not therefore able to state precisely the quantity of land; but from the seed planted (being but nine and a half bushels) it could not have exceeded an acre—probably less. The yield was two hundred and sixty bushels of the finest quality of potatoes I have ever raised. The land was planted with potatoes in 1852; sowed in the fall with winter rye, which I took off the following summer; ploughed the land in September, and turned in quite a crop of green grass and weeds; ploughed it again last spring, after spreading on eight or ten cords of good barn compost manure. The potatoes were planted in May.

MARBLEHEAD, November 13, 1854.

Statement of Benjamin Huntington.

I take the liberty of presenting to your notice a statement of the culture and product of one-half acre of ground, on which onions were raised the present season. The land is situated in the south-easterly part of Danvers, near Gardner's farm. It was formerly a part of Whittredge's orchard, a few of the trees remaining. It is a strong dark-colored soil, and has always borne good crops of whatever was put upon it. It has sometimes been in grass, and at other times under culture. The entire piece on which onions were planted contained about two acres. I had gathered five hundred and fifty bushels when it was suggested to me by a gentleman long interested in your society that I had better measure exactly the amount grown on half an acre. Accordingly I selected a square piece, and had one half acre measured off by Joshua Buxton, Jr., a competent surveyor. From this I gathered three hundred and seventy-nine bushel baskets full, as they were sorted and cleaned for the market. I have no doubt they would have measured four hundred bushels as usually shovelled from a pile together. The onions were large and plump, and as fair looking as I ever saw. The seed I raised myself. I applied about six cords of well-rotted stable manure to the acre; sowed in rows fourteen inches apart and kept the ground clear of weeds. On one corner of the field the trees impeded the growth of the crop considerably. There may have been superior crops in this neighborhood, but I have never seen one that I thought was better.

DANVERS, October 1, 1854.

Statement of James Manning.

I have this season planted on the field belonging to Messrs. Sanders and Roberts, in Hamilton, one and one-tenth acres with carrot seed. I sowed one and a half pounds of seed. The land is low and level; for three or four years past it has had but little manure; but this season I spread on about three cords of horse manure and ploughed it in. Value of manure, twenty dollars. After raking the ground, I then planted it in rows with long orange carrot seed, and finished gathering the crop November 9. Value of labor, forty dollars. The yield was about twenty tons. I have weighed and sold, or otherwise disposed of, thirty-nine thousand six hundred and twelve pounds, which, at fifty-five pounds per bushel, give seven hundred and twenty bushels and twelve pounds.

HAMILTON, November 13, 1854.

WORCESTER.

Report of the Committee.

The Committee of the Worcester Agricultural Society on Root Crops have attended to their duty. The work has not been very tedious. Three entries only were made to the secretary for premiums, and those exclusively of carrots—no entries for potatoes, turnips, or any other root crops having been made, owing, probably, to the potato rot for years past, and the severe drought the latter part of the past summer and fall. The committee deeply regret that their duties were so light that they are obliged to report so small a number of entries on the carrot crop in the large county of Worcester, and hope that in future a much larger number will be filed with the secretary, not merely to compete for small premiums, but to give light and information to Worcester County and to the world, through their statement of particulars in the different experiments in the cultivation of the carrot crop, the most important of all root crops since the appearance of the potato disease. The three competitors who made returns to the secretary were Harvey Dodge, of Sutton, William T. Merrifield and Samuel Perry, of Worcester. A day was appointed for the examination of the carrot fields entered for examination; but the chairman soon received notice that one of the committee, the Hon. John Brooks, of Princeton, was absent on duty as one of a committee from Massachusetts to the United States Cattle Show. On the appointed day the other two of the committee carefully examined the three lots of carrots aforesaid by digging them up in different parts of the fields, where, standing in all their different positions in the several rows, some were one and some twelve inches apart. The carrots entered by Mr. Dodge were on half an acre of land on which corn grew the year before. The land was ploughed ten inches deep, one part manured with green manure, at the rate of forty common cartloads to the acre, and the other part with leached ashes, at the rate of three hundred bushels per acre. That part manured with the ashes produced the largest crop. The rows were from sixteen to eighteen inches apart, and the carrots in the rows standing, generally, at a distance from each other of from one to four inches, and in many places in bunches, crowding each other for their rights—probably belonging to different political parties. The length of the carrots was from six to nine inches. Mr. Dodge cultivates his land between the rows with a cultivator drawn by a horse trained to the work, so as seldom if ever to step on the rows. He lets out the weeding of the carrots to boys by the job, at so much per acre. His half acre of carrots weighed twenty-one thousand two hundred and seventy-five pounds, grown at a cost of fifty dollars and fifty-four cents, and sold on the lot for one hundred and six dollars and thirty-seven and a half cents, leaving a balance for profit of fifty-five dollars and eighty-three cents.

For a more particular description, we refer to the

Statement of Harvey Dodge.

The land on which my crop of carrots was grown the present year is composed of a light loam to the depth of twenty inches, resting on a gravel substratum, entirely unlike the most of my other soils, which, as I have often stated, rest mostly on clayey subsoil, and are more retentive of moisture. This lot has always been productive when in grass, grain, or potatoes, but had never been worked deep enough to give what would be termed large crops of any kind. This lot was ploughed in 1846, manured with forty ox-cart loads of stable manure, and planted to corn; in 1847 it was sown with oats and grass seed, and was kept in grass, yielding about two tons to the acre, until 1851; in 1852 the grass did not yield more than one ton to the acre; in the spring of 1853 I determined to throw down a division wall, separating this from a three-acre lot on which I was growing table vegetables, and in trenching and sinking the large stones I had a chance to learn the character of the soil; the 1st of May, 1853, forty loads to the acre of manure from my barn cellar were carted on and spread, and turned under invariably to the depth of nine inches. A bush harrow was used to smooth down the furrow; the furrows were made three and a half feet apart, and corn planted the 20th of May, eighty bushels of leached ashes being spread broadcast on one part, and one hundred pounds of super-phosphate of lime on the other—the limed portion keeping the start conspicuously until August, when all its virtues were lost sight of—no traces being found at harvest.

By referring to my books the account with this lot stands as follows: Cost for labor and manures, fifty-two dollars and thirty cents; the harvest, seventy-five bushels of corn, was worth sixty-six dollars and thirteen cents per acre. May 5, 1854, two hundred bushels of leached ashes were carted and spread on one part of this half-acre, and four ox-cart loads (of thirty bushels each) of stable manure on the other part, spread and ploughed in with two strong yoke of oxen, the plough running twelve inches deep. After lying in the furrow until the 27th of May it was cross-ploughed, the plough not running so deep with one yoke of cattle. It was then permitted to dry two days, when the surface was made smooth with a bush harrow, ready for the seed to be sown.

Expense of cultivating eighty rods of carrots:—

May 5,	200 bushels of ashes, carting and spreading,	$14 00
	7 loads of manure, carting and spreading, .	8 50
	Ploughing with double team, . . .	2 00
27,	Ploughing with single team, . . .	1 00
	Harrowing and preparing for the seed, .	1 50
29,	1½ pounds of long orange carrot seed and sowing the same, . . .	2 00
June 10,	Two hands, half day, hoeing between rows,	1 25
19,	" " " " "	1 25
26,	Hoeing with onion hoe one-half day, . .	62

July 3,	Five hands one-half day weeding and thinning,	$4 17
26,	Cultivator drawn by horse, two hours, myself and horse, ...	50
Aug. 1–15,	Three hands thinning and weeding one day,	3 75
Nov. 1–7,	Digging out and topping, equal to three hands two days, ...	6 00
	Two hands two days, loading carrots in the field, ...	4 00
		$50 54

Income:—

21,275 pounds of carrots, sold on the ground for half a cent per pound, ...	$106 37½

Help for loading was furnished in all cases to those who came after the carrots; and in the few cases where my team was used for carting, a reasonable rate was charged. My only reason for selling so low as ten dollars per ton was, that it was much cheaper and more convenient to weigh in large quantities; besides, this half acre was not my whole crop—the balance, which was intended for my own stock, not yet being harvested; and I had also a large quantity of refuse table vegetables, such as beets, parsnips, turnips, and cabbages, which we expect to store for winter use in the barn cellar.

I have made no reckoning for use or interest of land; but against this I put the tops, which are quite valuable for green feed for soiling cattle; and it was formerly thought that one half the value of the manure was left for future crops. I can only say, in answer to this, that I would gladly give the use of all my land for at least one year, the tenant agreeing to cultivate it all to carrots as well as the above-described was.

Deep and clean culture, and doing all the work while the sun shines, are the chief requisites for profitable carrot growing. My expenses have been somewhat increased the present year by the higher rates demanded for field labor. I seldom, if ever, worked my usual farm laborers on this crop, other than carting manure and ploughing, fitting the ground, sowing the seed, and assisting at harvest. Young and cheap help, good for nothing in haying, offer their services for tending this crop, and they are always more expert than our best hay hands in weeding and tending. For this reason I have found it difficult after driving hay harvest to get good hay hands to work on vegetables in fine weather, and in foul I had rather they would rest. The rows were about sixteen inches apart, and the plants were about ten or twelve inches. In this way I can grow more weight and sounder roots. In order to insure a sufficient number of plants, I sow three times the quantity of seed I formerly did, and let all grow till the second weeding, when they are thinned to my liking. It costs no more to pull a carrot root than a weed, and the ground is perforated to the advantage of the standing plant. Prepared manure, of whatever kind, is the only fertilizer to be used. The compost may be saturated with salt brine strong enough to kill the weed seed there may be in its ingredients.

The rates, as given in the bill of costs, it is believed, will entirely cover all expenses. The land was measured by Mr. Sibly, a practical surveyor. The entire crop was actually weighed as the loads were sold, and all certified to but one load, which was weighed in baskets.

SUTTON, November 7, 1854.

Mr. Merrifield's carrots offered for premium were on half an acre of ground, ploughed twelve inches deep, manured with ten common ox-cart loads of barn-yard compost manure, spread and ploughed under the fall before the sowing of the seed. This crop of carrots was the third or fourth crop in succession grown on the same land. The rows were about thirteen inches apart, and were situated in the rows similar to Mr. Dodge's, except some few vacant places where the seed did not vegetate, and with the exception, also, that the carrots were more interested in the subsoil, at the same time taking as great an interest in the freesoil as Mr. Dodge's, if they did not crowd quite so hard for their political rights. The length of the carrots was from seven to ten inches generally. The labor of hoeing and weeding was performed by Irish laborers by the day, under the direction of the owner, but only occasionally in his presence, he being engaged in other business besides farming. Mr. Merrifield's half acre, although managed by men who were most of the time their own masters, produced twenty thousand three hundred and eleven pounds of carrots, at a cost of fifty-one dollars and fifty cents, and worth, as appears by his statement, one hundred and thirty dollars—leaving a balance of profit of seventy-six dollars and fifty cents.

Statement of William T. Merrifield.

The crop of carrots which I enter was grown on a lot measuring one-half acre. In 1853 the land was under a state of good cultivation, and was manured with fifteen loads of compost. Twenty thousand pounds of carrots were raised on three-fourths of the half acre. In the spring of 1854 the land was in about the same condition as it was in 1853. After harvesting last year, ten loads of barn-yard manure were put on, spread, and ploughed in, and this season seventeen ounces of good quality orange carrot seed put in. The seed was sown with a machine on the 13th of June, and the carrots weeded with hoes in July and August. Every tenth row was weighed when harvested; and taking them for average, the crop weighed twenty thousand three hundred and eleven pounds. The ploughing and sowing occupied four and a half days, the weeding ten days in July and ten days in August, and the harvesting sixteen days. The seed cost one dollar, the manure ten, and the labor forty dollars and fifty cents. The total value of the crop was one hundred and thirty dollars. In 1852 there were raised on the same lot thirty-one thousand two hundred pounds.

Mr. Perry's field of carrots offered for premium contained half an acre of land, ploughed twelve inches deep, and manured at the rate of about fifteen common ox-cart loads of green manure annually to the acre. Carrots and other root crops had been raised on the same ground three or four years in succession previous to this crop. The hoe was the only implement used among his carrots except fingers; and the labor of hoeing and weeding was mostly performed by boys ten years of age, for recreation during the recess of their school days. His carrots came up more even in the rows than the other two lots, which made their arrangement in the rows of a more suitable distance from each other. Their average length was from six to ten inches. Mr. Perry's carrots have long been at work under ground silently and secretly; and had his statement been filed with the secretary in time, they probably would have made as clean a sweep on the root crop premiums of Worcester county as the Know Nothings have of the other political parties in Massachusetts. The weight of his carrots was twenty-one thousand three hundred and sixty-seven pounds, and sold at the rate of one hundred and six dollars and ninety-eight cents for the lot. Cost of raising the same, forty-five dollars, leaving a balance for profit of sixty-one dollars and ninety-eight cents. Mr. Perry thinks his crop would have been larger if it could have remained in the ground a few days longer; for, on trying an experiment with a wire around one of his carrots one and a half inches in diameter, he found its increase in circumference from November 1 to November 4 to be one-third of an inch.

Could not Mr. Perry, and all others, find a remedy for the above difficulty in sowing their seed earlier in the season? Notwithstanding Mr. Perry's crop of carrots was of more weight, and raised at less expense, than the other two competitors, he is debarred from a premium by reason of his delay of one day in filing his statement with the secretary. Therefore the committee recommend that a gratuity of four dollars be paid to him out of the society's funds.

The committee, after taking all the different facts into consideration, award the first premium of six dollars to Harvey Dodge, of Sutton, for the best crop of carrots raised on his half acre of land; and five dollars to William T. Merrifield, of Worcester, for the next best crop of carrots on the half acre entered by him.

Statement of Samuel Perry.

The half acre of carrots which I enter for the society's premium for 1854 has had carrots in it, with some variations, for three previous years, having had beets, parsnips, and oats on some parts, without showing any perceptible difference between the crops of carrots following these various other crops and that on land occupied by carrots for four successive years.

The following is the result of this year:—

I spread on eleven loads of barn-yard manure, bushed with heavy bush, ploughed deeply, then harrowed and bushed thoroughly. I raked it over, and sowed the seed on the 1st of June; weeded the latter part of June, and again the latter part of July. I pulled out the weeds in August and September; commenced harvesting November 4, and finished November 9.

Expenses:—

Eleven loads of manure,	$14 00
Drawing and spreading the same,	2 00
Ploughing, harrowing, and bushing,	2 00
Raking and sowing,	2 00
Hoeing and weeding in June,	6 00
Weeding again in July,	5 00
Pulling weeds August and September,	1 50
Harvesting half acre—10 days' work, at $1.25 per day,	12 50
	$45 00

Value of the crop:—

Ten loads of carrots, sold for ten dollars per ton, weighing twenty-one thousand three hundred and ninety-seven pounds, or ten tons thirteen hundred weight and ninety-seven pounds,	106 98

The chairman of the committee having visited several fields of carrots not offered for premium, within a few weeks, hopes to be indulged a few moments in giving the conclusions arrived at from the facts in the case, although he may differ from many farmers in these enlightened days of agriculture. The several fields visited were found to be ploughed or dug up from six to twenty-four inches deep. Some carrots were found growing very thick and some very thin in their rows, but all rows about the same distance from each other. Some were manured with green manure and some with compost, but all were cultivated or taken care of in about the same way. In most cases the shortest carrots were found on land ploughed the deepest, while those on land ploughed six inches deep were of a greater length, and those on land of eight or nine inches, of the greatest length. From the facts above named, and many others that could be mentioned, he has arrived at the conclusion that land ploughed eight or nine inches deep, manured with long or green manure annually, and sown with carrots for years in succession, will produce at the least expense, with the least labor, and to the greatest profit; and that carrot rows eighteen inches apart, with the carrots often so near as to crowd each other a little, and about eight inches in length, on land ploughed and manured as aforesaid, will produce the greatest weight of carrots to the acre, and of the best quality. A few of the reasons, not before named, for such a conclusion, are these: That land ploughed eighteen inches deep requires double the manure that nine inches does, and also double the labor in ploughing, consequently doubles the expense in fitting the land for the seed; that it is natural for heat to ascend, and not to descend; that the nine inches receives nearly as much of the sun's heat as the eighteen inches; that eighteen inches cannot all be sufficiently warmed by the rays of the sun, but in part by warm water, and when that fails, as in case of a dry season, a sufficient quantity of heat cannot be furnished to those lower regions; that the weight of the carrot is in the first eight inches from the top, while the part below is slender and light; that the carrot which strikes a stone in running down six inches will grow larger in diameter and of about equal weight to that which runs down ten inches; that it is natural for roots of trees, corn, potatoes, plants and vegetables, to run near to the top of the ground in search of light and heat; that nine inches will stand the drought or the flood as well as eighteen inches. This statement, made in so much haste, is not intended for a guide, but only for a hint from which other experiments may be made and reported to this society. The object of the society is agricultural improvement; and without experiments, hints, reports, conversation and meetings, improvements in agriculture will advance but slowly towards perfection.

CHARLES BRIGHAM, *Chairman.*

WORCESTER NORTH.

Statement of C. M. Woodward.

Potatoes.—I here present for your consideration the following statement of an experiment in raising potatoes the present year. The land upon which my potatoes were raised was broken up on the 5th of June last with a Michigan plough, ploughing very deep. Young apple trees had previously been placed in the piece, at the distance of thirty-six feet each way. The different squares between the trees, which contained about four and four-fifths rods each, were planted on the 6th of June, and treated alike in every way except in the application of different manures. Two squares were manured by a small handful of plaster in each hill at the time of planting. In the next one I put the same quantity of plaster, and, in addition, one table spoonful of guano, placing the plaster under, and the guano over the seed. On the next square only guano was used, being applied in the same way as the plaster. On the fifth square no manure of any kind was used. The potatoes were hoed twice, and dug on the 17th and 18th of October.

The average amount dug from four and four-fifths rods, on which plaster alone was used, was four and four-fifths bushels, or at the rate of one hundred and sixty bushels to the acre. The amount raised on the piece on which both plaster and guano were used was six bushels, or two hundred and eight and two-thirds bushels to the acre. On the piece on which only guano was used there were five bushels, or one hundred and seventy-three and eleven-twelfths bushels to the acre; and on the piece on which no manure was used were three and three-fourths bushels, or one hundred and thirty and ten-thirteenths bushels to the acre.

The potatoes were of the kind called "round reds." They were large and fair, though much larger where the manure was used than where it was not. The seed potatoes were very small ones, having been separated from the good potatoes last year.

The cost of the manures I am not prepared to give, but it could not have been very large. The difference in the products of the several pieces can be attributed to nothing except the manure, as the land was of about the same quality, being a light, deep loam upon a clay subsoil.

HAMPSHIRE.

Statement of Calvin D. Eaton.

Potatoes.—I offer for premium a crop of potatoes raised on one acre of land in Pelham. The piece was old pasture land, with some brush on it. In May I ploughed it twice, then harrowed and planted with peachblow potatoes. I used no other manure than one hundred and twenty-five pounds of plaster, and hoed only once. I dug the potatoes about the 12th of October. I used two barrels of dry ashes before hoeing. My crop was one hundred and seventy bushels of extremely large potatoes, many of them weighing over one pound.

Value of crop:—		
170 bushels, at 40 cents,		$68 00
Expenses:—		
Interest on land,	$1 20	
Ploughing and harrowing,	6 00	
Planting,	4 00	
Seed and plaster,	7 00	
Hoeing and digging,	8 00	
		26 20
Net profit,		$41 80

Pelham, October 30, 1854.

Statement of Chester Cowles.

The land on which this crop was raised contains one acre. It is old pasture. I ploughed it in May and planted eight bushels to the acre, and harvested in October. I put on the manure at the rate of twelve loads to the acre.

Value of crop:—		
150 bushels, at 50 cents,		$75 00
Expenses:—		
Seed,	$4 00	
Ploughing and harrowing,	2 50	
Manure,	12 00	
Spreading and harrowing,	1 50	
Planting and hoeing,	6 00	
Digging and carting,	8 00	
		34 00
Net profit,		$41 00

AMHERST, November 14, 1854.

HAMPDEN.

Statement of J. H. Demond.

Carrots.—I herewith furnish you my account current with the crop of carrots raised by me on eighty rods of ground the present season. The soil appropriated to this crop is a sandy alluvial, a portion of which was covered with corn sown in drills, and used while in a growing state as extra feed for my cows the previous season; the remainder was mowing turf. In preparing for the present crop I used fifteen loads of compost manure, thirty bushels to the load. This was evenly spread, and on the ploughed part was turned under twelve inches deep, but on a portion of the turf land it was covered ten inches, and on the remainder the manure was harrowed in upon the reversed sod. After being well harrowed, long orange carrot seed was sown, in drills eighteen inches distant, about the middle of May. The growing crop required very little labor in the cultivation. It was hoed but twice during its growth, and was uncommonly free from weeds. In harvesting, a one-horse plough was passed as near the rows as possible, removing the earth from the carrots. By this process the labor of lifting them was greatly facilitated and rendered much easier; and they were all gathered on the 1st of November, measuring four hundred bushels, and weighing fifty pounds per bushel.

Expenses:—

Cultivating and harvesting,	$18 00
One-half manure expended,	8 00
Interest on land,	6 00
	$32 00

Value of the crop:—

400 bushels of carrots, at market price, 33 cents,	$132 00

SPRINGFIELD, November 25, 1854.

Statement of Sumner Chapin.

Carrots.—The lot on which the crop of carrots which I enter for premium was grown contains eighty-four rods. I raised on the same lot last year (1853) tobacco and cabbages, about one-half devoted to each. It was well manured, and gave me a good crop. About the first of May I ploughed the lot and put on eight cords of manure, a part of which was spread on and ploughed in, and the remainder was spread in the drills before sowing the seed. The amount of product was four hundred and twenty-five bushels, and weighed twenty thousand eight hundred and twenty-five pounds; and the amount of labor performed, with cash expenditures and value of crop, was as follows:—

Expenses:—

Ploughing and preparing the ground,	$3 00	
Sowing,	50	
Weeding and harvesting,	35 00	
Cost of seed,	75	
Cost of manure,	18 00	
		$57 25

Value of the crop:—

Carrots, at thirty-seven and a half cents per bushel,	$159 38	
Tops,	4 00	
		$163 38
Net profit,		$106 13

FRANKLIN.

Statement of Elihu Smith.

Carrots.—The piece of ground upon which my carrots were grown lies with a gentle slope towards the east of from two to four degrees. It had been down to grass for several years previous to 1853, with occasionally a top-dressing of manure, when it was ploughed, turning under at the rate of twenty loads of manure to the acre, and then planted with corn. The worms destroyed much of this crop, so that the yield was no more than an average one. In the spring of 1854 manure was again ploughed under, at about the same rate as last year, and in some of the last days of May it was sown to carrots.

Used one of Ruggles, Nourse & Mason's seed sowers; left the rows from one-half to two feet apart, and the carrots in the rows within from three to four inches of each other. By measurement the piece contained twenty rods, or one-eighth of an acre. On harvesting, (allowing fifty pounds for a bushel,) the yield was one hundred and thirty bushels, making at the rate of one thousand and forty bushels per acre.

Expenses:—

Three loads of manure,	$3 00	
Ploughing,	25	
Preparing ground, sowing and seed,	1 50	
Weeding and thinning out six days,	6 00	
Harvesting four days,	4 00	
		$14 75

Value of crop:—

130 bushels of carrots, at 25 cents per bushel,	$32 50
Profit, ...	$17 75

SUNDERLAND, 1854.

Statement of O. & F. H. Williams.

Carrots.—The ground on which we raised the crop offered for premium measured one-half of an acre. It was of a light loam, turf land, had been down to grass three years, and was in good condition. Ploughed eight inches deep with Michigan double plough. The manure which we applied was composted with dirt, about one load of the latter to two of the former, making in all twelve cartloads.

Expenses:—

Ploughing, ...	$1 00	
Harrowing, ...	1 00	
Manure, eight loads, ...	8 00	
Carting and spreading, ...	1 00	
Planting with planter, one and a half feet apart,	25	
Half pound seed, ...	40	
Hoeing first time, three days, ...	3 00	
" second " four days, ...	4 00	
" third " two days, ...	2 00	
Ploughing between rows, ...	25	
Harvesting, ...	6 00	
Interest on land, ...	3 00	
		$29 90

Value of crop:—

336 bushels, at 25 cents per bushel, . . .	84 00
Profit, ...	$54 00

SUNDERLAND, 1854.

Statement of Aaron O. Buddington.

Carrots.—The amount of land sown for this crop was nine rods, on which carrots had been raised four years. The general state of the land was good. In 1853 it was manured with fifteen loads of stable manure, and produced three hundred and sixty bushels of carrots. In the spring of 1854 I manured with fifteen loads of stable manure, forty bushels to the load; spread the manure, ploughed as deep as I could, rolled the land, and sowed with one and a half pounds of orange carrot seed. It was sown on the 25th of May, and harvested with the spade. Four hundred and fifty-six bushels were raised, averaging fifty pounds to the bushel. The expense of the seed, manure, labor, and cultivation was forty-five dollars. The value of the product of 1854 was one hundred and fourteen dollars.

LEYDEN, 1854.

Statement of O. & F. H. Williams.

Turnips.—The piece of ground on which we raised our turnips this year contained fifty-two rods. The soil is of a light loam, having been down to grass three years. After taking off a crop of grass, we turned the sward over without manure eight inches deep. In this way we obtain two crops a year. The land was not in a high state of cultivation.

Expenses:—

Ploughing and harrowing,	$1 00	
Drilling with machine two feet apart,	25	
Seed,	12½	
Ploughing between rows,	25	
Gathering crop, three days,	3 00	
		$4 62½

Value of crop:—

61 bushels, at 25 cents per bushel,	15 25
Net profit,	$10 62

Owing to the extreme dry weather, our crop was unusually light.

Sunderland, 1854.

BRISTOL.

Statement of Henry D. Deane.

Ruta-baga.—I offer for premium a crop of ruta-baga turnips, raised on forty-three and nine-tenths rods; the product being two hundred and fourteen bushels, weighing forty-eight pounds per bushel; the weight of the crop amounting to ten thousand two hundred and seventy-two pounds.

The soil is a gravelly loam. A crop of carrots was taken from the land the preceding year; the manure applied was twenty bushels of leached ashes. This year it had twelve bushels of dry ashes spread on one-half of the land, and three loads of compost manure on the other, after it had been ploughed; then it was thoroughly cultivated in. I then sowed the seed, with a seed sower, eighteen inches between the rows. The plants were thinned and hoed in July. The crop was much injured by the drought.

Yield, 214 bushels, worth 30 cents per bushel, .	$64 20
Expense of cultivation, ...	15 42
Profit, ...	$48 78

Mansfield, 1854.

Statement of Richard A. Leonard.

Turnips.—I submit the following statement in relation to the manner in which I obtained ninety-eight bushels of English flat turnips from one-quarter of an acre of land. The land was sward, and I spread on it a cord and a half of stable manure, and then ploughed it about eight inches deep, on the 20th of June. I sowed it broadcast on the 20th of July, and hoed and thinned in August. The turnips were pulled the 1st of November.

Value of crop,	$30 00
Whole expense,	10 50
Net profit,	$19 50

RAYNHAM, 1854.

Statement of Abiel Bassett.

Onions.—The quarter of an acre of land on which were grown the onions entered by me for premium has been sown with onions for a number of years. The last of April I carted on ten loads of stable manure, and ploughed and hand-raked the ground smooth. April 26 I sowed with a seed-sower, fourteen inches between the rows. The seed came up and grew well until the drought, which affected the crop very much. Yield one hundred and fifty bushels.

Statement of D. & R. Perkins.

Carrots.—The quarter of an acre of land entered by us for premium on carrots is a sandy loam. It was planted to potatoes last year. About the 10th of May we put on fifteen cart-loads of compost manure, ploughed nine inches deep and hand-raked it, and planted the orange variety with a seed-sower, in rows eighteen inches apart. Owing to circumstances unforeseen when we entered for premium, we found it expedient to plough it again and re-sow, which we did on the 15th of June, the same as at first, thinning them out in the rows about four inches apart. The plants suffered much from the drought the first of the season, but are doing well now, (9th of October,) and we think growing as fast as at any time. Had the visit been a few weeks later, we think there would have been quite a difference in the product of the rod selected and weighed.

Expenses:—

Ploughing, raking, and sowing,	$1 75
Hoeing, weeding, and thinning out,	10 00
	$11 75

We think the tops given to our cattle will fully pay for harvesting the crop. Yield, one hundred and sixteen and three-fourths bushels.

Statement of Nahum Snell.

Carrots.—The quarter of an acre of land on which my carrots were raised, which were entered for premium, consists of yellow loam, on which I drew eight loads of good compost manure. It was in corn in 1853. It was sown about the 20th of May with orange carrot seed. It was ploughed twice with a heavy sward plough and raked smooth; then sown on a level surface with a seed-sower, in rows fifteen inches one way, and as thick the other as they could grow to advantage. Owing to the dry weather, some parts did not come up well. The yield was one hundred and thirteen and three-fourths bushels.

Statement of Spencer Leonard, Jr.

Turnips.—Having entered as a competitor for the premium offered for the best crop of ruta-baga or French turnips on a quarter of an acre, I will state that the ground was sown to barley in 1853, and produced a fair crop. In June of this year there were spread upon the stubble two cords of good stable manure, which were ploughed in. Twenty-five bushels of leached ashes and sixty pounds of Peruvian guano were spread upon the furrows and well harrowed. The seed was planted on the 21st of June with a seed-sower, in rows thirty-four inches apart, occupying about one hour. In about four weeks they were thinned out and hoed, at a cost of two dollars and seventy-five cents. Eighteen days after the first hoeing they were hoed again, at a cost of one dollar and seventy cents.

Expenses:—

Two cords of manure, and applying,	$10 00
Twenty bushels of ashes and applying,	3 00
Sixty pounds of guano and applying,	2 00
Ploughing,	50
Harrowing and sowing seed,	75

Hoeing, twice,	$4 45
Seed,	20
	$20 90

Yield, one hundred and sixty-six and three-fourths bushels, or at the rate of six hundred and sixty-seven bushels an acre.

CRANBERRIES.

BARNSTABLE.

Report of the Committee.

The committee on cranberries have attended to the service assigned them, and beg leave to say that there has been of late so much said and written respecting the cultivation of cranberries that they do not deem it necessary, at this time, to offer much on this subject.

We would say that it continues to be a profitable business to those who have entered into it in good earnest, and have been willing to labor and toil to accomplish the desired end as they would in every other enterprise in which they expected success.

We are fully of opinion that, for the first two years after the vines are set, or until they become strong and matted together, the utmost vigilance in most cases is necessary to keep them free from grass, brakes, and rushes; and without such vigilance a few only can expect to succeed.

The crop this season in this county has been rather smaller than usual—owing, we think, mostly to the unusual height of water in the swamps and ponds in the early part of the season, and the severe drought in July and August. We have, however, examined some lots which would compare favorably, as to the quantity and quality of the fruit produced, with any we have ever seen in years past.

The specimens displayed on this occasion were very good; but as the society's rules with regard to the manner of cultivation, quantity of land, expense of culture, &c., were not conformed to, the committee do not deem it their duty to award any premiums.

All which is respectfully submitted,

OBED BROOKS, JR., *Chairman.*

OCTOBER 11, 1854.

FARM IMPLEMENTS.

ESSEX.

From an Address by R. S. Fay, Esq.

The first great difficulty which a New England farmer has to contend with, at the present time, is the difficulty of procuring labor, and its excessive dearness. It is a fact, too, strange as it may appear, that the quality of labor has deteriorated in an almost inverse proportion to its demand and price. We pay double the wages of twenty years since, and we receive not much more than half as much labor in return, and at the same time the general products of the farm have not materially advanced in value. This state of things must lead to one of two results: we must either supply the place of much of this labor by machinery, or we must give up our farms, allowing them to return to their original waste. We are forced to do that which sharp competition and the desire of gain have accomplished in all other industrial pursuits, by calling to our aid mechanical skill, and applying, wherever it is possible, its labor-saving power to the operations of the farm. Yankee farmers should certainly verify, to the fullest extent, the old proverb, that "necessity is the mother of invention," for there is no place where the demand upon her prolific powers is more urgent than upon New England soil.

It is a melancholy and mortifying truth, however, that we do not take advantage of the labor-saving implements in successful operation elsewhere. Other countries, and some of our sister states, are before us in this respect. In Great Britain, where labor is comparatively abundant and cheap, the increased use of labor-saving machinery within a few years past has been most remarkable. All the principal operations of the farm, such as planting, hoeing, weeding, threshing, hay-making, and harvesting, are now greatly aided by labor-saving machines. Indeed, it would be a rare sight there to see any kind of seed sown by hand, or its subsequent culture carried on by mere manual labor; and what is still more to the purpose, the work is much better done now than it could possibly have been under the old methods.*

In comparison with English and Scotch farming, we are in our infancy in this respect, and we have a vast deal of lost ground to make up before we shall reach their high standard. It is quite time that our agricultural societies should give a strong impulse in this direction. It will not do for us to sit longer with folded hands, and allow ourselves to be outstripped in the race of improvement, contented to live on under a reputation for skill, energy, and intelligence which we have well nigh lost. Although we have not set the example and shown the way, we are not too late to follow that of others, and perhaps not yet too late to take the lead.

This county is eminently a hay-producing one. It is the money crop on which many farmers rely principally for a cash return to meet the outgoes of the season's work. Although I do not consider it a profitable crop, under any circumstances, to the extent to which it is usually carried, yet it must always hold a very important place in point of value among our products. Labor-saving machinery can be made to play a most important part in the management of this crop; and by lessening the cost of harvesting it, the increased profit will invite to a more varied course of cultivation, even if it be only with a view to increase its amount. There are many disadvantages incident to the hay crop, especially when it forms a large proportion of the produce of the farm. It is bulky, and requires a large force to make it; the time for harvesting it in proper order is short, making it difficult to procure sufficient labor at the right moment to secure it in good condition. The work comes in the very hottest season of the year, and the exposure under our burning July suns costs annually many valuable lives. Philanthropy, as well as self-interest, therefore, should stimulate us to adopt every method calculated to save as much of this labor as possible.

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* I speak with some confidence upon this point, having resided lately for nearly two years in a rural district in England, and during that time being in constant intercourse with practical farmers as well as scientific agriculturists.

That this may be done to a very considerable extent, has been demonstrated during the past summer. The mowing machine has been introduced into our fields, and has worked quite as successfully as could have been expected at this early stage of its career. The objections to it are mostly of a nature which practice will readily overcome, and doubtless many improvements are yet to be made in it. Much depends upon us in order to give this implement a fair trial; and we should endeavor, each one by his actual experience, to point out how it can be further improved. There are some who object to its use on account of the smallness of our enclosures and the roughness of our fields; but to my mind these are arguments in its favor, since, if it be necessary to have larger enclosures and smoother fields, we shall only be forced to do that in order to work it which, as good farmers, we ought to do under any circumstances. So, too, another objection, not unfrequently made, that it requires a skilful man to direct its operation, is equally in its favor, for it will bring that skill to our farms which is now so greatly needed. You may rely upon it, that labor connected with the exercise of intelligent skill will never be a want in this country. Our farms have ceased to be a favorite scene of labor to our young men, because the work to be performed is mere drudgery, without pleasure or excitement to the mind, but full of weariness to the body. If, however, you will bring to the farm the steam engine or horse power, and the various implements they put in motion, our children will gladly remain upon the homesteads they now desert for the factory, the machine shop, and the railroad. He who delves and digs the earth from morning till night has little time and less inclination for thought—he becomes a mere toil-worn machine at last; but if he is connected with an implement, the working of which he is to guide and direct, his position is completely changed; he is then a master over a slave—a truly soulless slave, that labors without sweat to do his bidding.

There is another labor-saving implement, connected with the hay crop, quite as important to the farmer as the mowing machine; this is the hay-maker. It has been long known and universally used in England, and is now coming into notice in this country, much simplified in its construction, and in consequence much cheaper in price. It is easily worked by a single horse, and will save the labor of five or six men. This implement, with the mower and the horse rake, will make the hay harvest an easy and comparatively inexpensive task, saving the cost of all three of them on some farms in this county in two or three years.

But, in recommending the adoption of these and other labor-saving implements, I may be told that they are expensive, and will not therefore save labor enough to make it an object to purchase them, except upon very large farms; that a farmer, for example, who cuts one hundred tons of hay may save by their use; but, for one who cuts only twenty or thirty, the outlay would be out of proportion to the saving to be accomplished. This objection is certainly a serious one, though capable of being obviated in most cases. Massachusetts is a land of small farmers, and we must therefore resort to the principle of association, so well known and practised upon for various other purposes, to accomplish what is beyond our individual means. We must combine together in the purchase of expensive agricultural implements, and arrange for their use in a way to secure perfect fairness and equality. This is only one of the many ways by which the cost of them may be very much reduced. If sufficient encouragement were given, persons could be found in every community to work them on their own account, going from farm to farm as a regular business, profitable to all parties. This is practised to a very considerable extent among the small farmers in England. It is not unusual there to see a travelling steam engine on wheels, going through an extensive district, threshing wheat and performing other work which does not occur often enough to make it an object for the farmer to purchase such expensive machinery for his own use. Mowing machines have been worked in this way during the past season in some of the neighboring States, and have been found a very great saving of time and labor. What a blessing a steam engine, force pump, and a few hundred feet of leading hose would have been to many farmers during the late drought for the purposes of irrigation, where the land was so situated as it respects water to admit of its being done! Many crops could thus have been saved which the drought destroyed, and others rendered sufficiently more abundant to have paid the cost of its use.

I would most earnestly impress upon the society the importance of increasing the amount and number of prizes for implements, with a view of encouraging their exhibition at our shows. Farmers can only learn in this way how much there is within their reach to enable them to carry on their operations at the least cost. Books and newspapers describe the principle of a machine well enough; but it requires to be seen, and, if possible, put to work, to convey a just idea of its value and importance. Nothing that I have ever seen surprised me more, or gave me greater pleasure, than the implement department at the English agricultural shows,* outnumbering and surpassing in actual value every thing else, fat cattle and still fatter pigs included, and demonstrating, in the most unmistakable manner,

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* At the Gloucester Royal Agricultural Show, 1853, the number of implements exhibited was 1,803; number of exhibiters, 121; total declared value, $120,000; average cost to purchase, $66.

At Lincoln, this year, the number was about 3,000. A comparison of the last four years of the number of implements exhibited at the Royal Agricultural Society's Shows with the corresponding year of 1840 will convey a correct idea of the great attention this subject is exciting in the best cultivated country in the world.

1840.	Number of implements exhibited, . . .	36
1841.	" " " . . .	312
1842.	" " " . . .	455
1843.	" " " . . .	508
1844.	" " " . . .	948
1850.	" " " . . .	1,197
1851.	None this year.	–
1852.	Number of implements exhibited, . . .	1,722
1853.	" " " . . .	1,803
1854.	" " " . . .	3,000

The prizes awarded for the agricultural implements in 1853 amounted to forty per cent. of the total awards for that year. The prizes awarded for agricultural implements in Massachusetts were only one and one-fourth per cent. of the total awards for the same year.

the important position that machinery now takes on a well-managed farm. The show yard for implements occupies several acres, regularly laid out, leaving wide spaces between the rows of temporary buildings erected to contain them, so that every opportunity is afforded for examining each article and to learn the principles of its construction and its method of working.

ESSEX.

From the Report of the Committee.

The exhibition of farming implements was much less extensive than it ought to have been, and much less than was expected, considering the assurances given by those who had it in their power to exhibit. But as "beggars should not be choosers," we will make the best we can of what we saw. There was an entire failure on the part of claimants to conform to the conditions on which premiums were offered; so that no one will have any good reason to complain if no award is made in their favor.

Several mowers or machines for the cutting of grass by the power of horses or oxen were presented. One by Ruggles & Co., of Boston, a new machine, made by Ketchum, of Buffalo; one other of Ketchum's machines by W. F. Porter, of Bradford, which had been used on his farm the past season; and one by Fisk Russell, of Boston, claiming to be an improvement on Ketchum's. The committee took much pains in the course of the season to witness the practical operation of these implements. On the farm of Mr. Waters, in Beverly, they saw this operation more extensively than any where else. Mr. Waters thus describes it:—

"One of your committee used Ketchum's two-horse mower the past season, and mowed over fifty acres with great satisfaction. All the different varieties of English grass were cut with it; and it operated well on all, especially on heavy grass of two or more tons to the acre. It surprised many who witnessed its operations to see with what facility it cut over uneven surfaces where before trial it was supposed it could not be made to work. The horses used were common farm-horses, the pair weighing about one thousand nine hundred pounds. While being operated it frequently came in contact with fast stones and stumps of trees, and proved itself equal to the encounter, receiving no injury whatever. The points or guards have a wonderful effect in protecting the cutters from injury."

General Sutton also operated one of Ketchum's mowers on his farm to his entire satisfaction. He used a pair of active, seven-foot cattle, by the aid of which he was able to cut an acre of heavy grass in one hour, and to continue to work so for four or five successive hours, and this, too, on uneven land not well adapted to this kind of operation.

The committee took pains to ascertain the operation of this implement on the Pickman farm in Salem, on Porter's farm in Bradford, and on Barker's farm in Andover; and generally, wherever it was tried, and wherever those who undertook to manage it knew how to use it, they found it well spoken of. Most of the imperfections with which it was charged were to be attributed to the want of artistic skill in those who used it, bringing to mind the folly of employing an ordinary blacksmith to repair a delicate watch.

With experience in the use of this implement, the committee were prepared to express an opinion of it as a highly valuable implement, which, when perfected as it admits of being, is worthy the attention of our farmers.

The committee found a frequent objection to the mower that it required too much power to operate it, and thus fatigued the animals. This was true only when the knives were not as sharp as they should be, or when some part of the machinery was sprung from its proper position, which might well happen when struck against a fast rock, stump, or tree, as before mentioned, even without being observed at the time.

On the day of the exhibition the committee were taken quite aback in the opinion they had formed of mowers by the presentation of an improved implement by Mr. Russell, of Boston, moved also by horse power, but cutting on a different principle. The committee witnessed the use of this implement, and were highly pleased with it. They were informed that the inventor intended to secure a patent for it, but had not yet done so. They do not, therefore, feel at liberty to describe its peculiarities. In view of the several mowers presented to their notice, the committee are free to say that they believe the time is not far distant when the grass on New England farms will be mainly cut by implements of this description. They therefore recommend that there be paid to William F. Porter, of Bradford, and Fisk Russell, of Boston, gratuities of ten dollars each for the mowers exhibited by them, as a trifling compensation for their efforts to gratify the public curiosity by a sight of these *novel machines.*

The attention of the committee was called by Mr. Bryant to one of Emery's threshing machines that he had been using on farms in Boxford and vicinity to the entire satisfaction of those for whom it was used. No opportunity was given to see its practical operations, any further than to see the principle by which it operated. With this the committee were well pleased, and recommend that a gratuity of five dollars be paid to Mr. Bryant for his trouble in exhibiting this valuable implement. We hear it spoken of with approbation by men in whose judgment we have much confidence.

A portable cider mill was exhibited by Elbridge A. Howard, of North Reading. The prejudices of the committee against that much-abused article, *good cider,* are not so strong as to prevent their examining impartially any improved implement for the making of it. So long as there shall be any occasion for the use of *vinegar,* so long it is believed will cider be esteemed of value, to say nothing of other uses that those who love it have a right to make. But we must be satisfied that the machine is a decided improvement. This we cannot say of Mr. Howard's mill. That it will cut apples into small particles we have no doubt; but that as much juice can be pressed from these particles as from the pomace when passed through a well-constructed mill, carried by horse power, we have great doubt. We therefore say nothing in favor of this cider mill.

The attention of the committee was called to a *corn planter,* carried in the hand, and used for the distribution of the kernels of corn and covering them. It may probably be applied to a useful purpose in some cases; but it appeared to be a small affair, scarcely worthy any special notice of the committee. The whole expense of the implement is five dollars.

A double plough, No. 33, and a horse hoe, No. 1, made by Ruggles & Co., were exhibited by one of the committee. They appeared to be first-class implements of the kind, highly creditable to the skill and ingenuity of those who made them. Of this form of plough the committee have heretofore, more than once, expressed a decidedly favorable opinion.

The committee were instructed by the committee of arrangements to examine a steam engine planned and constructed by two lads of Lawrence. This engine is thus described by the boys:—

"During the second year of our apprenticeship, in the summer of 1853, having determined to build an engine, after some deliberation we selected a design that seemed to possess what we desired. We began at once on the drawings and working plans. In the fall and winter of 1853 and 1854 we finished the plans, and with some assistance completed the patterns and got ready the castings by the first of April. We then commenced building the engine, and completed it ready to run by the first of July. We were interrupted somewhat during the time, so much so that we worked only fifty-five days each from the time it was commenced until it was completed. The design of the engine is similar to the machines built at the Lawrence machine shop—of horizontal bed and cylinder. The cylinder is of three-inch bore and nine in stroke, furnished with the common slide valves, driven by eccentrics on the main shaft, connecting with rocker arms placed on the side of the bed. The cut-off valve shuts off the steam at one half stroke. The fly wheel is three feet in diameter, three inches wide on the face, and weighs, finished, one hundred and ten pounds. The power of the machine, running one hundred and twenty strokes per minute, is from two to three horses. Total weight of engine is three hundred and sixty pounds.

F. M. POWER.
W. S. KIMBALL.

To MR. PROCTOR, Chairman of Committee, &c."

The committee have great pleasure in noticing this specimen of artistic skill. They think it highly creditable to the young men who made it, neither of whom, as they are informed, exceeds eighteen years of age. They have never seen any thing presented at any of our shows more worthy of commendation. They recommend that a gratuity of five dollars be paid to each of the young men, and that the expense of placing the engine in the hall for exhibition (as it may be certified by Mr. W. M. Kimball, father of one of the young men) be paid by the treasurer of the society. Also that a complimentary diploma, signed by the president and secretary, with the seal of the society annexed, be prepared and presented to them by the secretary, as a perpetual memorial of their early promise.

The committee are happy in being able to inform the trustees that, in addition to his other munificent efforts in aid of the objects of the society, they have received from Richard S. Fay, Esq., an offer of *two hundred dollars*, as a donation to be applied, under the direction of the trustees, for the best use of a mowing machine on not less than fifty acres, in the county of Essex, in the season next ensuing. The letters of Mr. Fay containing this offer, addressed to the chairman of this committee, will be deposited with the secretary.

J. W. PROCTOR, *Chairman.*

WORCESTER.

From the Report of the Committee.

The articles exhibited under this class were, with one exception, from the establishment of Ruggles, Nourse, Mason, & Co. Too much praise can hardly be awarded to this firm—and it is the only prize which your committee are able to bestow—for the variety and perfection of their articles, and their public spirit in contributing so materially to the interest of the exhibition.

The assortment of ploughs was very large, and fully sustained the reputation which this establishment has so long maintained for excellence in this department of agricultural tools.

Your committee desire to call particular attention to the double swivel plough and the steel plough. The report of the committee on the ploughing match has already given you the result of the trial of these ploughs in the field.

Among the churns exhibited was a thermometer churn, which so regulates the temperature of the cream as to make butter in the shortest time and of the best quality. Your committee recommend this churn to the attention of our farmers, as being superior to those in common use.

Many other articles, such as corn shellers, fanning mills, carrot weeders, meat cutters, &c., were exhibited to your committee, and all seemed to them worthy of a more extended notice than the proper limits of this report would allow.

But the mowing machine, made and exhibited by the same firm, deserves more than a brief and passing notice.

With the exception perhaps of McCormick's reaper, your committee are of the opinion that no more valuable improvement in agricultural tools has been introduced to the public for many years. A majority of the committee have seen experiments made with the machine under circumstances well calculated to test its utility. They do not hesitate to say that in the saving of labor, in the thoroughness and perfection and rapidity with which the work is performed, it presents to the farmers of this county advantages over the old method of mowing which can hardly be over-estimated. An acre of land has been well mown by the machine in thirty minutes—from forty-five to sixty minutes is its ordinary work. With a single span of horses, from ten to fifteen acres may be mown in the usual working hours of one day. With a single horse, about two-thirds of this amount of work can be accomplished. Your committee take the liberty to say, that, for ordinary work in the county, machines with a single horse will be found sufficiently effectual. We are informed by the manufacturers that three hundred of these machines have been sold in New England during the present season, and that the reports from farmers who have used them are highly favorable to their utility.

And in this connection the committee desire to say a word in favor of the hay-making and spreading machine made and exhibited by Ruggles, Nourse, Mason, & Co. This improvement is of recent date, and may have been suggested by the one of which we have just been speaking. Its practical working is stated by those who have seen it in operation to be most successful. It is thought that in favorable weather, by the use of these machines and of the horse rake, grass may be mown, spread, converted into hay and stored in the barn in a single day. This simple statement, of the correctness of which we have no doubt, is sufficient to commend these machines to every farmer who has any considerable amount of mowing land.

Your committee cannot close their report without expressing their regret that a larger number of specimens under this class was not presented for their examination. In a department so important it might have been hoped that there would have been a full and valuable collection. Perhaps some explanation of the deficiency may be found in the fact that this building is not yet quite completed, and that the facilities even now afforded for an exhibition were not generally known. We venture to express the hope that, on the next anniversary of the society, the number, variety, and value of the agricultural tools presented for exhibition will leave nothing to be desired.

JAMES DRAPER, *Chairman.*

HAMPSHIRE.

Report of the Committee.

"Mind makes the man." It may be said with as much truth that mind makes the community or nation. The Yankee mind is said to be peculiarly inquisitive. Whether inquisitiveness and inventive genius are necessarily copartners, we will leave for doctors and philosophers to decide, inclining, however, to the opinion that they are. The live Yankee, with his bosom companions, a jackknife and pine stick, almost invariably produces something both novel and useful. Be this as it may, we may rest assured, in this age of mechanical fairs, agricultural societies, and baby shows, that the genius of America is inventive.

The character of our inventions, whether in science or art, is eminently practical, adapted to our wants, and calculated to elevate all classes and conditions of society. Other nations may have excelled us in matters of taste and luxury; but it is only in countries like our own, with its vast territory and unbounded resources, where minds, always busy and uninfluenced by the vagaries of olden time, are so eager in the search after wealth and progress, that invention assumes its true character of administering to the wants of all. As a natural result of our wants as a nation, our efforts have been eminentl successful. American genius has controlled that mighty power, steam, and demonstrated its great superiority as a propelling power, thus rendering it subservient to the wants of man. It has tamed the fury of the lightning's power, and bidden it go on messages of mercy rather than of vengeance. It has tunnelled mountains, levelled hills, filled up valleys, explored the bottom of the sea, dug deep into the bowels of the earth for hidden treasures, and visited the starry spheres above.

It has become a matter of history, a "living epistle, known and read of all men." In the brief interval from one agricultural fair to another we may not perceive any remarkable change; but when we look back for but one-half century, who can fail to observe the "signs of the times," and to look forward with renewed hope and confidence into the future?

In improved implements of husbandry, there has been a marked advance within a few years. Science has thrown her light upon the farmer's pathway, rendering his occupation both pleasant and profitable. The drudgery and monotony of the farmer's life are fast wearing away under the potent influence of mowing, winnowing, and threshing machines, seed-sowers and planters, corn-shellers, patent churns, and patent cow-tail holders. Necessity, "the mother of invention," has caused great improvements to be made in all the implements of husbandry; and the farmer can give no satisfactory reason why his work should not be done in its season, and *well done*. Yet we fear there are many, who, from mistaken notions of economy, or fear of spending the "almighty dollar," follow in the beaten track of their fathers and grandfathers. Such would prefer the Syrian plough of old—which was made of the branch of a tree, cut off below some crook and tipped with iron, and drawn by a small cow or ass, merely scratching the surface of the

PLATE VI.

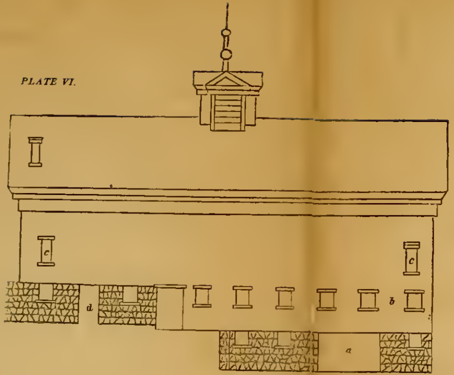

PLATE IV.

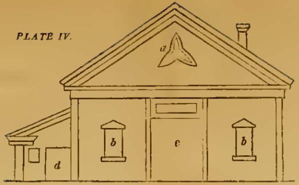

PLATE VII

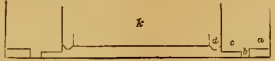

PLATE V.

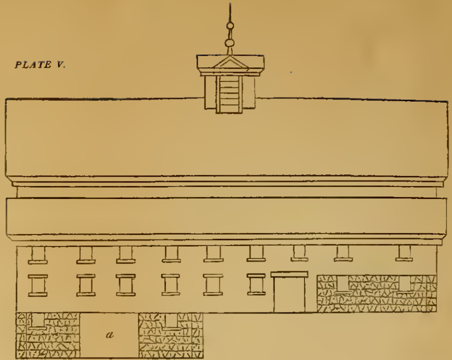

PLATE I.

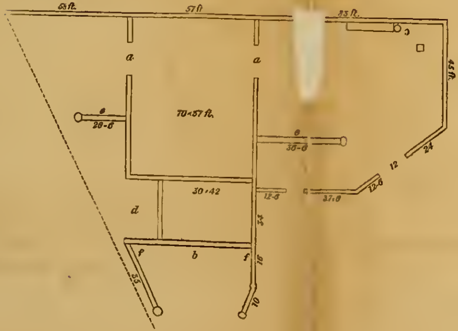
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PLATE II.

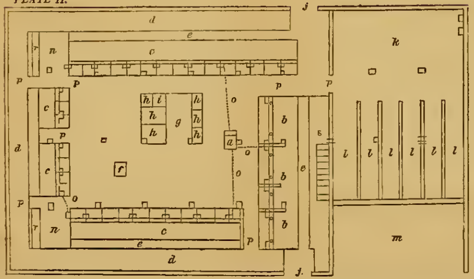
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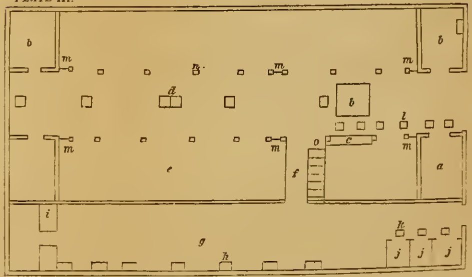
PLATE III.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PLAN of the Barn of B. V. FRENCH, Braintree. (See Page 241.)

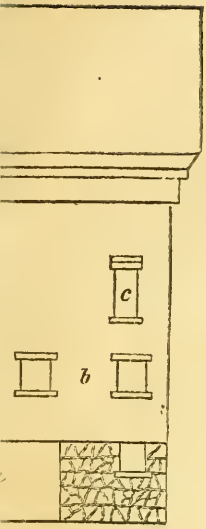


PLATE IV.

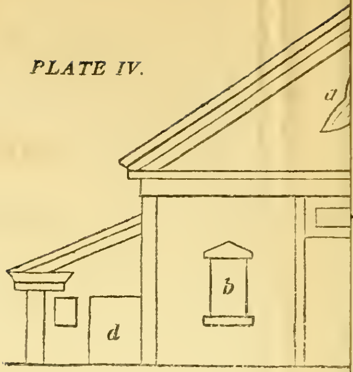
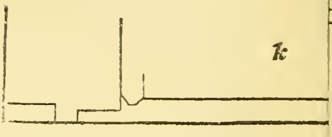


PLATE VII.



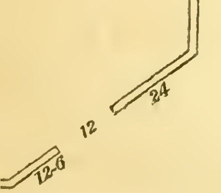

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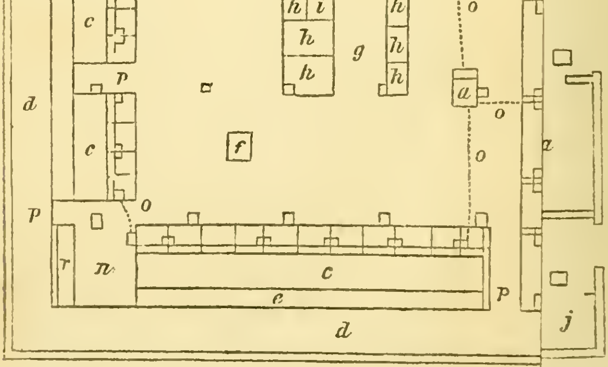
PLATE II.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ground—to the double, cast-iron plough of the present day, that is capable of pulverizing the soil to the depth of twelve or fourteen inches. No good farmer will fail to employ these aids to labor, which, as experience has taught, tend to improve the condition of all classes and to advance civilization. The farmer and mechanic are bound together by the strongest ties of interest, and whatever contributes to the prosperity of the one operates equally to the advantage of the other. We cannot forbear, here, from alluding to the too common practice of furnishing our youth with worn-out or refuse tools, and then requiring too great an amount of labor, or finding fault with its execution. We need not wonder that they look upon agriculture as servile or slavish, and on its votaries as mere serfs, and leave the old homestead, with all its hallowed associations, in pursuit of other occupations. Encourage them, not only by precept and example, but by surrounding them with those comforts and conveniences, which none but the husbandman can enjoy, which are so well calculated to secure that greatest of earthly blessings—a contented and happy mind.

Charles H. Field, *Chairman.*

FARM BUILDINGS.

The committee of the Norfolk Society, appointed to visit various sections of the county to ascertain and report on the condition and prospects of its farming, speak as follows: "We cannot but notice great improvements in the construction of farm buildings in different parts of the county. We regard this as an indication of increased interest as well as success in agriculture, and of more study and reflection upon the best methods of conducting its operations. Among those recently erected we might specify the barn of Hon. B. V. French, in Braintree, as, for convenience and labor-saving, an almost faultless model. We would advise all, of whatever means, who intend to build, to examine Mr. French's barn, because, in our opinion, it is excelled by none in the county."

The plan of this barn is presented in the adjoining cut.

The barn stands on a triangle at the junction of two streets, the ends being nearly east and west, the sides north and south, the land descending somewhat to the east.

The scale of plate I. is that of forty feet to the inch. It represents the first story, or manure cellar, seventy feet by fifty-seven, the walls being laid in solid masonry, with a floor laid with split stone, inlaid with cement and mortar. *a a*, doors to the cellar, fourteen feet wide. The door on the north side is kept closed in winter. Spaces *d* and 30 by 42, are filled up by an embankment of earth. *e* 26 6 represents a wall embankment, with a post at the end. Another embankment is seen at *e* 36 6. There is a gradual ascent over these embankments to the doors entering into the linto for the cows. There is a slight ascent also from *a* to the dotted line, representing Elm Street, north of the barn, and also from *a* through the yard, and out at 12 into Adams Street, on the south side of the building. *c* is an aqueduct of running water from a mill stream, and supplying water in the yard. *f f b* is the foundation at the west end of the barn, built of solid stone masonry; the walls on the sides, being thirty-five feet, sixteen feet, and ten feet, are bank face walls, with posts at the end, filled in and graded so as to give a gentle ascent over it into the third story, where all hay, &c., is unloaded.

Plate II. The second story is drawn on a scale of twenty feet to an inch, too small be well understood. *m*, shed, open for carts and wagons to remain under cover, thirty by fifteen. *l l l l l*, bins for vegetables to be filled through scuttles from the floor of the third story. It is surrounded by solid walls. The area of this whole floor equals one hundred feet by fifty-seven. *k*, open space, and nearly on a level with the cow chamber, through the door *p*. *s*, stairs to third story and to the cellar. *d d d*, passage next to the walls, five feet wide and nine inches above the dung pit. *e e e*, dung pit, two feet wide, and seven inches below the floor where the cattle stand. The manure drops from this pit into the cellar below, five feet from the walls, and quite round the cellar. *c c c*, plank floor for cows, four feet six inches long. *b b b*, stalls for three yoke of oxen on a platform five feet six inches long. *n n*, calf

pens. *r r*, feeding troughs for calves. The feeding boxes are made in the form of trays, with partitions between them, and each animal has its water constantly before it. The water is brought from a well, at a distance of eight hundred feet, by a lead pipe to cistern *a*. This cistern is regulated by a cock and ball, and the water flows by dotted lines *o o o* to the boxes, and each box is connected by lead pipes well secured from frost. *f*, scuttle by which sweepings, &c., may be put through into the cellar. *g* is a bin receiving cut hay from third story, or hay room. *h h h h h*, bins for grain feed. *i* is a tunnel to conduct manure or muck from the hay floor to the cellar. *j j*, sliding doors on wheels.

Plate III. The third story floor is one hundred feet by forty-two, the bays for hay, ten on each side, being ten feet front and fifteen feet deep, and the open space for the entrace of wagons, carts, &c., twelve feet wide. *b*, hay scales. *c*, scale beam. *m m m m m m*, ladders reaching almost to the roof. *l*, scuttle holes for sending vegetables direct to the bins *l l l, &c.*, below. *a a b b*, rooms on the corners for storage. *d*, scuttles, four of which are used for straw, one for cut hay, and one for muck for the cellar. *n* and the other small squares are eighteen feet posts. *f*, passage to the tool house, a room one hundred feet long by fifteen wide. *o*, stairs leading to the scaffold in the roof of the tool house. *i i*, benches. *g*, floor. *h*, boxes for hoes, shovels, spades, picks, iron bars, old iron, &c. *j j j*, bins for fruit. *k*, scuttles to put apples into wagons, &c., in the shed below. On one side of this tool house are put ploughs and large implements, hay rigging, harrows, &c.

Plate IV. Front, or view of the west end, in which a small chimney is seen on the roof leading up from the vegetable cellar below. *a*, window. *b b*, windows. *c*, door entrance. *d*, entrance to tool house. All the doors to the barn slide on rollers.

Plate V. On the north side of the barn are seen windows, doorway, &c. The stone work which is seen at the west end on the second story should have been placed fifteen feet farther back under the barn. The space which seems to be occupied by it is the shed for the housing of carts, &c. The ventilator contains on the top a lightning rod, points of the compass, and weather vane designed to imitate a Devon ox.

Plate VI. represents south view, where is seen the chimney in the roof. *c c*, windows in third story. *b*, windows to corn room and vegetable cellar. *d*, door to vegetable cellar. *a*, door to cellar.

Plate VII. represents a transverse section of the cow room. *a*, walk five feet wide. *b*, dung pit. *c*, cattle stand. *d*, feeding trough, with the bottom on a level with the platform where the cattle stand. *k*, open area forty-three by fifty-six. This room is furnished with a clock and thermometer, and is admirably ventilated, while at the same time it is sufficiently warm for the health and well being of the cows. The water in this room has not been frozen during the past severe winter, with the exception of that in a small box near the door. The manure in the cellar is levelled down once a week and covered with muck. The cellar being tight, all the liquid fertilizing matter from the floor above can be used to the best advantage.

The barn is simple in its construction, not expensive for its size, and well adapted to the purposes for which it was designed. It is especially adapted to the ground on which it stands; and though not every farmer could afford to build at the same cost, it contains many improvements on most other plans which could be brought within the means of most who intend to build. It will be seen that, including the three stories, this barn contains facilities equal to a barn two hundred feet long by fifty-seven wide.

The cost of this structure cannot be exactly known, since a good deal of the work was done at various times by laborers on the farm, and no exact account was kept of the amount of this labor. It is supposed to have exceeded six thousand dollars. This barn stands near the station in Braintree, where it may be seen and better understood.

WORCESTER NORTH.

From the Report of the Committee on Experiments.

The committee on "Experiments connected with the Pursuit of Agriculture" have attended to the duty assigned to them, and herewith present their report.

The offer of a premium for experiments, the specific character of which is left to the experimenter, is a new feature in the proceedings of this society; but we are inclined to hope and believe that, though the first, it may not be the last time at which it will occupy a position among the bounties annually distributed.

That individual who thoroughly and understandingly institutes or conducts an experiment, and gives to the public a careful and reliable report of it, adds something to the general stock of information, and more especially if such experiment be an original one. The whole of our knowledge, not only agricultural, but that pertaining to every department of life, has been slowly and laboriously derived from the results of a continued succession of experiments; or, in one word, from experience. It is immaterial whether Nature, unaided, places the experiment before us, or whether she merely suggests. If we are but able to grasp the whole in such a manner as to learn the lesson which she is capable of teaching, we can then communicate it to the world as so much experience or knowledge.

While very few persons are able to originate an experiment of any importance, almost any one can carry it through when full directions are given for the purpose. Many, however, perform any thing of the kind in such a careless manner that their results are worth little or nothing when obtained. This arises from the fact that such persons are not in the habit of making observations upon any subject with the care that is requisite for success in cases of this kind. Every agricultural operation, the results of which are to be recorded for the benefit of others, should be carried on with all the precision and exactness which characterize the chemist in his operations in the laboratory.

Every complete experiment in the cultivation of crops should be performed comparatively, in order to make it of any use. Because one farmer raises a superior field of grain, or other product, under the use of some special manure, it does not necessarily follow that the manure is to account for that superiority. It may have been that differences in soil, locality, season, cultivation, or some other influence, has contributed to bring about this result.

Not only should the experimenter use every precaution in conducting his labors, but he should confine himself to the strict letter of truth in making up his record, and he should be as willing to give the public the statement of an unsuccessful experiment as where the result is of the opposite character. Says Von Thaer, "Science would have made much greater progress if the false shame with which agriculturists conceal every unsuccessful experiment, and the exaggerated manner in which they often relate all those in which they have succeeded, had not retarded its progress."

Your committee regret that there have been but three entries made for their consideration; but they are disposed to think that another season will witness an increase in the number of experimenters, and, as a consequence, an increase in the interest and value of a report.

The first entry was that of the chairman of this committee, relating to his farm buildings, a statement concerning which accompanies this report. The subject of this experiment is of a character that should interest every one who contemplates building, either now or in the future. If the work is permanent and durable,—and we see no reason to question it, if due care is exercised according to the suggestions of that statement,—it is certainly a very important matter. There are very few farms in this region of our country which would not afford the principal materials required, merely for the picking up and carting, sufficient to construct all the ordinary buildings desirable. And when the house or barn is completed it is not a perishable wooden structure, requiring frequent repainting, but it appears to be of such a nature as to equal brick or stone in its durability.

Statement of Jabez Fisher.

I submit for the consideration of the "Committee on Experiments connected with the Pursuit of Agriculture" my farm buildings, with reference mainly to the materials of which they are constructed.

I do not pretend to any thing like originality in this experiment, but merely claim to have demonstrated, to any one who will take the pains to examine the work, the feasibility of the plan as first published to the world by O. S. Fowler, in a work entitled "Homes for All."

In some of the practical details I have differed somewhat from the plans as laid down by the author of that work, but in the main leading features we are agreed. I propose, however, to offer some general considerations, such as have been suggested by my experience, and at the same time point out certain difficulties which might occur to the embarrassment of the builder, and which would tend to destroy the confidence of the public in the whole plan.

Instead of the ordinary quality of shell lime recommended, I would use in all cases, where it could be obtained, the best of stone lime, as being the more profitable article. After slaking this lime in the manner proposed, instead of adding the stones and gravel together, I should prefer, unless the stones were all quite small, to add the gravel alone, in the proportion of eight or ten parts to one of unslaked lime. The gravel ought to be coarse and sharp, free from fine sand or any thing of the character of loam. After being thoroughly mixed, I shovel a layer of this mortar into the mould in which the wall is to be formed, some two or three inches deep. Stones of any shape or size, limited only by the thickness of the wall, are then bedded firmly into the mortar in such a manner that the stones may occupy all the space possible, with only just enough of the mortar to bind the whole firmly together and render it solid. A second layer of the mortar is then put in as before, followed by more stones, and this process is repeated until the mould is filled.

If the ground be of a wet or springy nature, the wall, as high as the top of the ground, or at least for a foot or two, might be formed in the ordinary manner—of large stone. A preferable mode, however, would be to under-drain the land so as to render the cellar bottom always dry. One material advantage possessed by the gravel wall for enclosing cellars, aside from the great saving in expense, is to be found in the perfect protection which it affords against the depredations of rats and other vermin, which are entirely excluded by it.

One other consideration to which I will allude is that regarding the season of the year at which this work ought to be performed. The proper and best time is during the hot summer months. It should not only be begun during this time, but completed. My own work was deferred too long, and has suffered in consequence. The whole of the outside ought to be finished before the time of the fall rains, and especially the grading which is to turn the water from the building.

The last subject to which I will refer is that which relates to the cost. This, of course, varies in different localities, according to the price of lime, the facilities afforded for obtaining gravel and stones, and the price of labor. I used the Pittsfield and South Adams lime, at an expense of about two dollars per cask. My gravel I was obliged to draw one-fourth of a mile. The stones were obtained in clearing the surface of the farm. The labor was all done by ordinary farm hands, no masons being employed except in putting on the finishing coat. My estimate of cost does not exceed five cents per cubic foot for the rough wall, and from one and a half cents upward per superficial foot for the covering, according to the kind of material and style of workmanship. This makes a saving of at least one-half as compared with wood, in the ordinary style of finishing a dwelling house; and it would not differ materially from the cost of barn walls well boarded and matched or battened. As compared with brick, by which it is not surpassed in any respect, there is a saving in expense of from two-thirds to three-fourths of the entire cost, so far as regards the walls.

The composition and style of finish of the outside coat may be varied according to the taste or means of the owner. Ordinary plastering mortar costs perhaps the least, is quite durable, and by a little skill may be made to look like hammered granite. A coat of water cement resembles sandstone. Hard finish may be made to imitate marble. Mastic cement, although rather expensive, makes a very durable and beautiful finish, resembling some of the best specimens of sandstone.

As no mere statement of this kind will enable any one to judge fully of the character of the work, or to gain much information of the detail of its construction, I would invite the committee, and all others interested, to visit and examine the buildings at any time when it may meet their collective or individual convenience. The location is a mile and a half northerly from the village in Fitchburg.

Barn of David Leavitt, Esq., Great Barrington.

This building is admitted to be one of the largest and best adapted to the purposes for which it is intended of any in the country, and in point of adaptation and convenience of arrangement is, perhaps, not excelled in the world. It is two hundred feet long and forty feet wide; the whole height is about one hundred and twenty feet.

As will be seen by reference to the engraving which accompanies this statement, it has three stories accessible with teams at either end. The manure vault is in the lower story, or basement; the second is mainly devoted to stabling; the third to the storage of hay, grain, machinery, &c.

The site of this building is as novel as it is convenient. The building spans a ravine two hundred feet in width and thirty feet in depth, and forms the wall of a dam bridling a fine stream which runs through the ravine, and elevating the water so that it is applied to a thirty-six horse-power water wheel, twenty-two feet in diameter, which is placed in the basement of the building, and affords ample power for wood and saw-mill saws, a planing mill, (one of Woodworth's largest,) a lathe, grindstones, and feed mill, a corn sheller, (Reading's patent,) which shells and cleans and bags five hundred bushels per diem, and a thresher, cleaner, and elevator of the same capacity as the corn sheller.

The thresher used is Zimmerman & Co.'s, made in Charlestown, Va. The threshing and straw cutting is done simultaneously.

The feed mill used is a self-sharpening iron mill, capable of grinding fifteen bushels per hour, patented January, 1855, and made by A. Felton, Troy, N. Y. The hay is pitched from the vehicles to the mows by the same power, by which arrangement four tons may be unloaded in one minute. A line shaft is extended into an adjacent arched dairy cellar, twenty by seventy-eight, in which the churning is also done by water power.

The minuteness of the description of the various machines used at this model farmstead is for the benefit of such of our readers as may require similar ones, as those described have been selected from the country at large, regardless of expense, by Professor Wilkinson, who is the steward as well as the architect at Brookside, and who, having spent twelve years as a teacher of practical and scientific agriculture, is perhaps as well posted up in such matters as any man in the country.

A description in detail of this mammoth building, with all its appurtenances, would occupy more space than we have to devote to it. Suffice it to say that no farmer who has not examined it, would, after visiting it, regret the time or expense incurred in so doing.

True, there are few who would attempt to duplicate, on the same scale, all that they may see there; but the principle on which it is constructed, in any or all its respective parts, is adapted admirably to the wants of farmers who may desire to erect new buildings or remodel old ones.

STOCK.

MASSACHUSETTS.

Report of the Trustees.

The course pursued by the trustees the past year varies so little from the reports of the last ten years, that, after examination of their records, they are of opinion that the best mode of fulfilling their duty is, to return the two reports following, made by two gentlemen of the Board of Trustees, and containing almost the entire transactions of the society for the past year.

The first report is that of committees of which the Hon. R. C. Winthrop was chairman, on the subject of premiums to be offered for distribution through the medium of the county societies.

Report of R. C. Winthrop.

Agreeably to the suggestion of the President of the Middlesex County Society, the trustees of this society have offered premiums to the amount of six hundred dollars during the past year for the best dairy stock. These premiums were offered through the medium of the Middlesex, Berkshire, Worcester, and Bristol County Societies, to whom it was left to decide upon the details of the competition and to adjudicate between the competitors. In Berkshire and Worcester the premiums were awarded and paid. In Middlesex no stock was exhibited which was considered worthy of a prize. In Bristol there was no competition.

The trustees of this society have recently resolved to continue these premiums in Bristol and Middlesex counties for another year, and also to offer them in Norfolk county, in Essex county, in the three river counties combined as one district, and in Plymouth and Barnstable united as a single district. For this purpose they have appropriated the sum of nine hundred dollars for the present year.

With a further view of testing the effect of competition in improving the breed of dairy stock, they have voted to make arrangements for a general show of dairy stock from all parts of the State for the year 1856 under the direction of the Worcester County Agricultural Society, at which premiums will be offered of an amount not less in the aggregate than twelve hundred dollars.

The trustees have also taken pleasure in complying with the request of the Board of Agriculture by placing one of their finest Jersey bulls at their disposal, to be kept at the farm connected with the State Reform School, and also by contributing by vote of a hundred dollars towards the expense of agricultural lectures.

It is hoped that in this brief statement there will be found a sufficient assurance that the State Society is disposed to coöperate with the Board of Agriculture to the extent of its means in promoting the great interests in whose behalf both associations were established, and which are vitally connected with the prosperity and welfare of our beloved Commonwealth.

The Jersey stock belonging to the society still continues under the care of Mr. Motley. The following communication from that gentleman furnishes additional evidence in proof of the value of that breed for the dairy, as well as of its endurance of our climate. The trustees have found no reason to question the correctness of the opinion entertained by many eminent farmers, both here and in England, that the excellence of this breed, in these very essential particulars, must render its introduction an important service to our agriculture. They feel assured that this society could not well render a more important service to the community than by bringing this opinion to the test of a thorough experiment.

Report of Mr. Motley.

I beg leave to submit the following report in regard to the breed of Jersey cattle. In making this report I shall speak of the full-blood animals belonging to the society, and also the full-blood and grade animals belonging to myself. They are all in fine health and condition; and I consider the fact fully settled now, that they can bear our winters quite as well as any other breed of cattle. I have raised calves dropped in each winter month, and they have all done well without any other shelter than a tight boarded barn, without clapboards or shingles save on the roof. From an experiment made about the middle of November last with a herd of thirteen cows for one week, viz.,—

Nine full-blood Jersey cows and heifers from two to eight years old;
One grade Durham cow thirteen years old;
One three-fourths Ayrshire cow five years old;
Two half-blood Jerseys two years old,—

it gave the result of a pound of butter from seven quarts of milk, on the following feed—about twenty pounds of hay and one peck of carrots per day. From the above herd one cow dropped a calf within thirty days after the trial, and the others are to calve in May and June next.

The quality of the milk is most excellent, and quantity very fair, and they hold out longer, so far as I know, than any breed. The butter made from the milk of Jersey cows will always command the highest price, and is of a rich gold color and fine flavor, even in winter.

They are daily growing in favor with our farmers and milkmen; and the time has already arrived when a Jersey cow is appreciated in Massachusetts and in very great demand.

These reports are respectfully submitted,

JOHN C. GRAY, *President.*

BENJ. GUILD, *Recording Secretary.*

The following statement of the pedigree of Kirkleavington 1st (11,640) has been furnished me by Paoli Lathrop, Esq., of South Hadley:—

He was bred by George Vail, of Troy, N. Y.—light roan; got by imported Duke of Wellington, (3,654,) dam (Lady Barrington 3d) by Cleveland Lad, (3,407,) g. d. (Lady Barrington 2d) by Belvedere, (1,706,) g. g. d. (Lady Barrington) by a son of Mr. Mason's "Herdsman," (304,) g. g. g. d. (Young Alicia) by Wonderful, (700,) g. g. g. g. d. (Old Alicia) by Alfred, (23,) g. g. g. g. g. d. by Young Favorite, son of Favorite, (252.) His blood is one-quarter Short Tail, out of Duchess (32) by Belvedere, (1,706;) one-quarter cow Oxford, out of Matchem cow by Duke of Cleveland, (1,937;) one-quarter Lady Barrington, (2d,) out of Lady Barrington by Belvedere, (1,706;) one-quarter Cleveland Lad, (3,407,) out of Matchem cow by Short Tail, (2,621.)

It will thus be seen that this animal is as full of the best blood of the herd of the late Thomas Bates, of Kirkleavington, England, as any bull in this country, except two or three which were out of Duchess cows.—ED.

The Oakes Prize Cow.

So much has been written and said about this celebrated animal that it has been thought desirable to state what is known of her origin and history.

She was purchased by Mr. Caleb Oakes, of Danvers, in the year 1813, then five years old, having been originally bought by Mr. B. Goodridge, of Danvers, at the age of two years, from the drove of a Mr. Copp, drover, from Randolph, Vt.* She was recommended to Mr. Copp as being one of a breed celebrated for its milking qualities. She was of a dark-red color, rather under size, and described by Mr. Goodridge as "high and broad behind, having a straight back, large belly, small neck and head, fine horns, bright eye, and in all respects symmetrical and handsome." While in possession of Mr. Goodridge she had her first calf, which at the age of four weeks made first-rate veal, weighing over twenty pounds the quarter. Mr. Oakes made from her the first year, and without over-feeding, no less than one hundred and eighty pounds of butter. In the next year (1814) he gave her ten or twelve bushels of meal, and made three hundred pounds of butter. In 1815 he gave her from thirty to thirty-five bushels of meal, and made over four hundred pounds of butter. In 1816 she calved on the 5th of April, and the calf, being very fine and fat, was killed on the 8th of May; after which she had good pasturage all the season, and was allowed one bushel of meal a week, together with all her skimmed milk. In June of that year Mr. Oakes weighed her milk, and found that she gave ten quarts at night, weighing twenty-six and a half pounds, and seven quarts in the morning, weighing eighteen pounds; in all, forty-four and a half pounds a day.

The quantity of butter made in the year 1816 was as follows:—

Before the calf was killed, . .	17	pounds.
May 15, ...	14½	"
" 22, ...	16	"
" 28, ...	17½	"
June 5, ...	19	"
" 12, ...	18½	"
" 19, ...	17	"
" 26, ...	18	"

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* It was stated on page 279 of the Agriculture of Massachusetts for 1853 that this animal was bought from a drove from the Kennebec. Such has been the general impression. The account given above, however, is believed to be the true state of the case.

July 3,	18	pounds.
" 10,	17	"
" 17,	16	"
" 24,	16	"
" 31,	16	"
August 7,	15	"
" 14,	15	"
" 21,	16	"
" 28,	15	"
September 4,	15	"
" 11,	16	"
" 18,	12	"
" 25,	15	"
October 2,	16¾	"
" 15,	15	"
" 21,	16	"
" 29,	16	"
November 7,	16	"
" 18,	18	"
" 23,	10	"
" 30,	13	"
December 10,	14	"
" 20,	10	"
Total,	484¼	"

As late as the 28th of December she gave eight quarts of milk per day. While in the possession of Mr. Oakes she had four calves, and suckled each of them over four weeks, besides furnishing to the family one quart of milk per day. The butter made from her was of a superior quality.

This cow received the prize of the State Society at the Brighton Show in 1816. She was purchased of Mr. Oakes by Hon. Josiah Quincy, who afterwards sold her to Colonel Samuel Jaques, of Ten Hills Farm, Charlestown. The cut which is here presented is pronounced by these gentlemen to be an accurate and admirable likeness of this remarkable animal. It is well known that she never produced offspring equal to herself for milking qualities. The effect upon her constitution by surfeiting and over-feeding, for the purpose of increasing her milk, in all probability, materially affected the character of her progeny, none of which are known to have been raised till after the year 1816.—Ed.

BRISTOL.

From the Report of the Committee on Breeding Stock.

A sincere desire on the part of your committee to awaken an interest in the breeding of good stock, and a wish to impress upon the farmers of Bristol County a sense of the importance of attention to blood, induce them to prolong this report even beyond the usual limits.

We have valuable materials at hand, and it is only necessary for them to be known and appreciated by our farmers, to make stock-growing vastly more remunerative in Bristol County than it ever yet has been.

There are among us intelligent farmers, who have added to practical skill and long experience the fruits of study and research in the broad field which the agricultural literature of the day opens to them. To such men the teachings of your committee will not be necessary. Nor do we address the "old fogy," whose ambition does not soar above the results produced by his great-grandfather. The narrow-minded farmer who is content to jog on, wrapped in a mantle of stupid prejudice, unmindful of the advantages which new usages and discoveries offer to him,—who is satisfied to live in a world of progress, yet clinging obstinately to the past,—will probably close his ears to all advice, and pursue his own policy, right or wrong, until the day when he is called upon to leave a world which has received no new beauty from his hands.

But there is still another class—fortunately a numerous one—to whom a word of advice may not appear impertinent. This class is composed of young men who are intelligent and enterprising, but whose opportunities for study have been limited, and whose habits of observation have never been properly cultivated. Such men are anxious to improve, but hardly know how to begin.

Who is there, who has mingled with New England farmers, who has not frequently heard men say, "Our native cattle are good enough;" "Why should we go to England for cattle to improve what is already good enough?" "There is Mr. ——'s cow; she's nothing but a native; and where'll you find a better?" Such remarks as these are made every day in every town in New England. They are founded not on prejudice alone, but on ignorance of the principles of breeding.

No one will dispute that scattered throughout New England are very many good cows, possessing, in a remarkable degree, excellent dairy properties. Many of these have no known pedigree, nor have they any mark that indicates the presence of foreign blood. They stand before us simply as good native cows. The owner of one of these cows, recognizing her value, is anxious to perpetuate her virtues, and retains her as a breeder. Having this good foundation for a valuable family of stock, how is he to proceed?

We do not propose to enter deeply into scientific breeding, though well aware that it is a subject of great interest, and deserving the earnest attention of stock growers. For such as desire to study it, there are books of great value, well worth the very reasonable prices at which they are sold; and there are agricultural papers scattered broadcast over the land, full of information derived not only from the works of those who have in past years devoted their strong minds to this subject, but from living breeders, who, with true public spirit, delight to contribute to their brother farmers the results of their studies and experience. Our purpose is to present a few hints to those whose attention has not been directed to blood, and to endeavor to point out how the materials within our reach, as farmers in Bristol County, may be applied to the substantial improvement of our stock.

The fact that a cow is a good one is not enough, of itself, to warrant the hope that her progeny will equal her in excellence, unless care is used in the selection of the bull to which she is bred. It is only when, by a long course of careful breeding, certain properties have become impressed upon a tribe of animals,—have become characteristics of the race, part of its blood, as it were,—that we can feel in any degree sure that an individual of that tribe will reproduce itself in its offspring. This is true of every one of the distinct breeds of cattle, and indeed of every species of our domestic animals. It is as true of the gamecock or the dorking as of the racehorse or the pointer. The distinct breeds or races of our cattle are all the result of attention to this great principle. Some of the breeds are more artificial than others where care has alone been observed to keep pure the blood of a family originally strongly marked. These more artificial breeds have been the result of greater care and skill on the part of the breeders, and their excellence has in many cases been proportionate to the care bestowed upon them. They are none the less entitled to the distinction of being *thorough bred* than are any of the older breeds, since their characteristics are as thoroughly impressed upon their tribes, and are as surely transmitted.* As a rule, an animal of one of the distinct and recognized breeds of animals is sure to impress upon its descendants the characteristics of its own breed or blood. So unerring is this transmission of inbred qualities, that a good breeder would on no account use the services of a bull not thorough bred, preferring the use of an inferior animal of undoubted pedigree to that of a bull of impure blood, though perhaps the more elegant and *apparently* more valuable of the two. Of course there are occasional exceptions to this, as to most general rules. In the hands of unskilful breeders, under the influence of accident, undue exposure, unfavorable circumstances of feed and climate, and perhaps other causes, individuals, and indeed whole families, of a certain breed may degenerate. Even these, however, can be more easily brought up again than low-bred animals; for blood will tell. Meanwhile the great principle remains the same. In proportion as an animal is full bred, or full blooded, is it probable that he will mark his offspring with his own characteristics. A recognition of this principle is of the first importance; and it cannot be too often or too strongly urged upon all who desire to breed good stock.

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* In explanation of our meaning, we may, as examples of what we style an *original* breed, point to the Devon cattle and the Arabian horse; while the short-horn and the English racer may be styled more *artificial*. In the cases of the former animals, the memory of man does not extend to the time when they were not marked and distinguished by their present characteristics; while the racehorse and the short-horns have been moulded by the skill and science of intelligent breeders.

A writer upon sporting dogs, remarking upon the power man in his intelligence possesses over even animal matter, illustrates the impression made upon the nature of the pointer dog, whose stanch points are so remarkable. Originally the dog paused when scenting his game, preparatory to making a spring. Men, observing this habit, endeavored to train him to stand firm. They succeeded; thus, as the writer wittily adds, "converting the semicolon of nature into the full stop of civilization." The same course, pursued for generations, has impressed this habit upon the race.

Let us now return to the owners of the before-mentioned "good native cows." What are they to do to perpetuate their good qualities? How, with such a foundation, is a valuable family of stock to be created, to do credit to the owner's skill and put money in his pocket?

The "old fogy," who turns up his nose at "book farmers," and scorns "foreign cattle," and recognizes no principle beyond saving an immediate penny even at the sacrifice of a prospective pound, drives his cow to the cheapest bull—some miserable, low-bred, mongrel beast, whose only power, perhaps, is that of impressing upon his get a portion of his own ugliness. "Old fogy" has paid but a quarter of a dollar, it is true; but he has a calf of but little value. This course is pursued for years, until the old cow dies and her virtues are all lost; while her owner attributes the success of others to mere luck. Is not this sort of breeding common? Is there not an instance of such a system to be found in every town?

How different from the course of the "old fogy" is that pursued by the intelligent, enterprising farmer, who knows the value of blood—who has studied the great principles of stock-breeding! He makes himself acquainted with the merits and history of the best bulls within his reach. He knows their breed if thorough bred, and their grade if only partially bred. He selects the bull most likely to impart to his get his own virtues and increase the good qualities of the cow. He pays more than twenty-five cents for the services of such an animal; but he rears a calf whose market value repays the outlay tenfold, while he has made a direct step upwards in his work of improvement. He feels encouraged to persevere. He watches carefully his herd, and step by step progresses, until his reputation as a breeder and his heavier pocket book attest his success.

The question may be, and often is, asked, "Why not begin with our native cattle, and, by careful and skilful breeding, rear a breed of natives which shall equal any foreign breed? It is acknowledged that our cattle are good: why not bring them up to an equality even with short-horns? Can we not do what others have done?"

We are doubtless a great people, we Yankees; but we should hardly give evidence of our sagacity, if, confining ourselves to native cattle, we should begin now to create a new breed. True, our successors might, a century hence, point with pride to their thorough-bred "Native Americans;" but, while glorying in the excellence of the cattle, they would be apt to doubt the acuteness of their Know Nothing ancestors, who had neglected to avail themselves of the experience, knowledge, and practical results of generations of breeders, who had devoted themselves to the creation and improvement of breeds of cattle that in 1850 equalled, if not surpassed, the Native Americans of a century later.

The fact is, the English have been for centuries a stock-breeding people, and have brought their cattle, horses, sheep, swine, and other domestic animals to a high degree of perfection. It is for us to avail ourselves of their experience, and ingraft upon our own stock the scions of their improved culture.

Perhaps a brief consideration of the merits and history of some of the prominent breeds of cattle—especially of those likely to come under the observation of the farmers of Bristol—may be interesting and serviceable to those who have not heretofore given much attention to the subject.

First, let us pass in review our native cattle. These can hardly be call'ed a *breed*, presenting as they do so few *marks of breeding*, so great a diversity in appearance and quality, and possessing so little of that power of begetting their own likeness which is inseparable from animals really well bred. Our native cattle are not indigenous to the soil, but are descended from animals brought to America by the early settlers. As a large proportion of the earlier immigrants were from Devonshire and the south of England, where the Devon cattle were even then popular, and where that breed had been long established, it was doubtless from that breed that the earlier cattle brought to America were principally selected. Even in the absence of documentary and historical evidence of this fact, the color and general appearance and characteristics of our cattle would warrant this belief. Other breeds, however, were not unrepresented in our early settlements. We have traces of several, including the Hereford and Galloway.

As among the immigrants many were men of very moderate circumstances, and others wholly unacquainted with agricultural pursuits, it is probable that many of the cattle were not animals of pure blood and high cost. Doubtless many were not selected with any reference to their breeding, but merely good cows picked up at the port of embarkation.

On their arrival in America these animals had doubtless to share the privations borne by their owners. They suffered from the effects of a severe climate, most unlike that of southern England. They had short commons and poor shelter. Add to these circumstances the probable inattention on the part of the masters to careful breeding, and there is no room for surprise that the cattle, as a race, degenerated, and lost all title to the dignity of being styled a breed.

In spite, however, of their degeneracy, our native cattle are not without great merit; and we may well congratulate ourselves on the possession of hardy cows, perfectly acclimated and accustomed to our New England pastures, from which we can easily select breeders of value, and from which, by the aid of good bulls of one of the imported breeds, we can raise up a stock of valuable cattle suited to our wants, whether required for draught, the dairy, or the shambles.

During the greater part of the present century importations have from time to time been made of thorough-bred Devon cattle. Latterly these importations have been frequent; and this stock is now widely spread through the Northern States. The Devon is probably the oldest of the English breeds of cattle, and possesses such intrinsic excellence that it would doubtless become a favorite in New England even if its color, size, and style did not appeal to a long-established local prejudice. It is from this breed that our cattle are mostly descended, and it is to it that most New England farmers will look for materials to improve their stock.

The thorough-bred Devon is a beautiful creature, of medium size, but of such nicely-balanced proportions that he usually weighs more than an eye accustomed only to our native animals would suspect. The color is commonly a deep mahogany red, with usually a white tip to the tail, a white stripe along the belly, and white about the udder of the cows.

Within a few years importations of Devons have been made whose color varies from the long-established type in being a light red. This novel color at first gave rise to questions as to the purity of their blood; but this is now, we believe, admitted. Much as we regret this innovation in point of color, we consent to it the more readily since among these light reds are animals of unsurpassed excellence, and bred by the best Devon breeders in England.

The head of the Devon is small, with a forehead broad and somewhat concave or dishing; muzzle fine; nose of an orange hue; and a ring of the same color is around the eye. The horns are clear and waxy—smooth, of a yellowish-white color, and elegantly turned upwards. In form the Devon is compact and symmetrical. His limbs are light, but with bone enough for activity and strength. The skin is of a clear orange color, covered with an abundance of soft, thick hair. As a breed they are good feeders, and produce beef finely marbled and very delicate.

They are not deep milkers; but they yield well, and their milk is of excellent quality. It is as the best breed to produce working cattle that the Devon is chiefly remarkable. No other breed so uniformly gives such active, docile, light yet strong and hardy-working oxen; and their resemblance to one another makes it easy to match them. No one who has seen a team of well-bred Devon oxen can fail to appreciate its elegance.

Private enterprise and the liberality of the Massachusetts Agricultural Society have introduced good Devons into this State; and here, in Bristol county, we have Devon bulls well worthy of the attention of all who desire to introduce this valuable blood into their yards.*

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* We are not, we think, going beyond propriety in pointing out the bulls of Mr. Allen, of Attleborough, Colonel Page, of New Bedford, and Mr. Knight Day,

We now turn to the noble "short-horns,"—or Durhams, as they were formerly called,—a race that has received more attention from eminent breeders than any other, and has probably produced more distinguished animals than all others together. No animals command such enormous prices as are constantly paid for short-horns, and no breed has greater merit.

Though not so old as the Devons, the short-horns are a breed of greater antiquity than is generally supposed, and were of great excellence a century before Colling, in 1784, commenced those experiments that resulted in the marked improvement of the breed, and made for himself a proud name in the annals of English agriculture. The work of Colling has been going on and continued to the present day, and at this moment occupies the attention of the most scientific and experienced breeders on both sides of the Atlantic.

As proofs of the antiquity of the short-horns, we may adduce not only reliable documentary and traditionary evidence, but we may appeal to the almost unerring certainty with which a short-horn marks his descendants with the characteristics of his race. This certainty is only to be found in individuals of long-established breed.

The short-horns are a showy family; and a well-bred specimen cannot fail to please the most fastidious taste. Their elegance and varied colors may perhaps partially account for their favor in the eyes of wealthy fanciers; but it is owing more to their intrinsic excellence that they are so eagerly sought for and command such enormous prices. Gentlemen of wealth alone can afford to purchase and import the finest animals; but few, even of such as can afford it, would lavish such sums as have within the past three years been paid for short-horns, but for their faith that the value of the animals warrants the outlay.*

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of Mansfield. The committee anticipated pleasure in examining a thorough-bred Devon bull, from the Webster stock, entered by Messrs. Lawton and Wilbar, of Somerset; but owing to the non-arrival of the Fall River cars on the morning of the exhibition, he, as well as other fine animals, did not appear upon the ground. The bull is represented as an uncommonly fine specimen of the breed.

* Mr. Jonathan Thorne, of Dutchess County, in 1851, expended more than sixteen

The short-horns are of every color between a rich creamy-white and a deep red. Commonly, however, they bear the two colors pied or blended into every imaginable shade of roan. Other colors than red or white, simple or in one of these combinations, are marks of impurity of blood. No black or brown hair is to be found on a well-bred short-horn.

The horns of this breed are short and thick, of light color, clear and waxy. They are not delicate and graceful, like the horns of the Devon, but rather clumsy, turning towards one another, and often drooping low. The neck is delicate and clean; brisket large; chest wide and deep; back straight and broad; form well spread and symmetrical, capable of sustaining great weight of carcass. The skin is mellow and covered with soft hair. As handlers they are preëminently fine.

The short-horn matures very early, and attains great size. The beef is of fine quality, and they tallow largely. The weights attained by animals of this breed are enormous. A three-year-old heifer, fed on grass and hay alone, weighed one thousand two hundred and fifty pounds. A calf seven months old weighed four hundred and seventy-six pounds. A four-year-old steer, fed on hay and turnips, dressed one thousand eight hundred and ninety pounds; and we constantly see recorded weights of short-horns not less astonishing.*

The short-horns are as a breed remarkable for their milking properties, though some families surpass others in this respect. That all do not milk equally well is probably owing to the variety of systems observed by breeders. A herd in which milk is only desired as food for calves is not unlikely to fall off in

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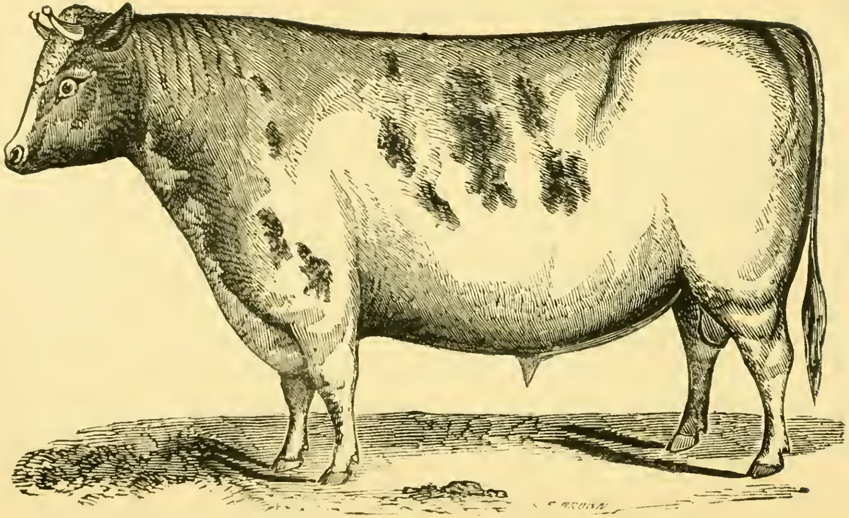
thousand dollars for eight short-horns, paying one thousand guineas in England for the bull Grand Duke, and prices in proportion for other animals. Mr. Thorne is a gentleman of large fortune, and doubtless finds a gratification in the possession of the finest animals in the world; but even he would hardly have made such an outlay had he not been convinced that the value of the animals would warrant the investment. Mr. Thorne may not himself realize great profits from this operation, but the benefits which the country will derive from his enterprise are incalculable. The descendants of his short-horns will be spread far and wide, and long be regarded as a monument to the liberality and public spirit of an enlightened American gentleman.

* The young bull shown by Mr. Alden at our recent exhibition was fifteen months old, and weighed one thousand three hundred and twenty pounds.



FIRST PRIZE AYRSHIRE BULL "WASHINGTON."

The property of Wm. G. Lewis, Esq., Lawn Farm, Framingham.

milking quality. The calves are allowed to run with their dams, taking what they please for four or five months. No care is taken to drain the last drop from the udder, and the cows are early dried off. This course naturally impairs the secretive powers of the cow, and affects the offspring in a like manner; though so thoroughly impregnated is the breed with the characteristic of good milking that it is probable that this quality could with care be restored to the family.

It may be considered as a settled point, notwithstanding individual exceptions, that the short-horns are superior milkers. Not a year passes that the extraordinary doings of some thorough-bred short-horn cow are not chronicled in the agricultural periodicals and certified by names of unimpeachable credit. We hear of cows giving from twenty-five to thirty quarts of *good* milk per day, and making two and one-half to three pounds of butter, and this upon no extraordinary feed.*

Grade short-horns are almost universally good milkers, not behind the thorough-breds. They are much sought for among the best dairy farmers in various parts of this country and in England. So common is it to hear of great milkers among these grades, that, whenever any remarkable statement of butter and milk is published, we are prepared to learn that the cow was of short-horn blood.† It is notorious in England, that, when a breeder desires to improve the milking property of his herd, he resorts at once to a short-horn bull.

We have dwelt thus particularly upon the merits of the short-horns, to combat the unfounded prejudice against the breed which exists in the minds of farmers ignorant of their true character, who object to large animals, and obstinately and absurdly adhere to one color—the common red of our section. There is no blood that can be mingled with that of our native cattle more capable of improving them in respect to milking properties than that of well-bred short-horns. This cross, too, in improving the *style* and *colors* of milch cows, will enhance their market value in the large towns; for it cannot be denied that the more wealthy cow owners fancy a large and *showy* animal, whatever may be the prejudices of the country farmers, and they are willing to pay for what gratifies their taste.

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* Mr. Allen's fine cow, which took the first premium at our recent show in New Bedford, made over fourteen pounds of butter a week on ordinary feed, and when not in her deepest milk. "Ruby," the grandam of the bull shown by Mr. Alden, took the first premium at the New York State Fair in 1850 as a milch cow. She made, from the 10th to the 20th of June, and from the 10th to the 20th of August, —a period of twenty days,—more than forty pounds of butter.

† It is worthy of remark, that, of the five fine cows offered for premium at our recent show, one was a thorough-bred short-horn; three were known to be grades and your committee could not doubt the presence of the same blood in the fifth.

The Devons will long continue favorites among the breeders of working cattle, and in this respect they deserve the first rank; but the accomplishments of short-horns under the yoke are by no means contemptible; while their early maturity, aptitude to fatten, and large size, render them profitable beasts for the grazier.

The high price of well-bred short-horn bulls will, probably, for some time to come, prevent their introduction in any great number among us; but we have one, at least, in the county, of great merit and unquestionable pedigree, coming from a good milking family, and having in his veins some of the best blood in the country.* Besides this animal, there are, we understand, other good bulls of this breed, and high and valuable grades; and we cannot too strongly advise the farmers to avail themselves of their services.†

Since the importation of Ayrshires in 1842 by that spirited breeder, the late Capt. George Randall, of New Bedford, that breed of cattle has been pretty well known and generally approved in the southern part of the county, and deserves our attention. The claims of the Ayrshires to the title of a distinct breed are still questioned by stock men, many of whom contend that they are nothing more than high, carefully-bred grades, a cross of thorough-bred short-horn bulls upon the small cows of the south of Scotland. The investigations of men of repute seem rather to confirm this opinion; while the general resemblance of Ayrshires to good grade short-horns, and the want of uniformity among them, mark them as a recent breed, probably of short-horn descent. However this may be, the merits of many Ayrshires of which we have knowledge cannot be questioned; and their reputation as dairy stock is considerable in this country. For our present purpose, it is proper to consider them as a distinct breed. As before remarked, the best Ayrshires are not unlike diminutive short-horns in general appearance, though they present a diversity in form and color not to be found in the older breed. They are commonly red and white, though black and brown hair often enters into the composition of their coats. As handlers they are deficient, and they are too small ever to become popular as working cattle or as subjects for the butcher.* It is as dairy stock alone that the Ayrshires have for some years maintained their reputation at home; and in that respect alone have they been considered worthy of attention on this side of the Atlantic. They are small and hardy, thrive on very moderate feed, and yield an abundance of good milk. This is the character claimed for them by their friends; and to a certain extent they have, in our own neighborhood, verified this reputation. They have so recently appeared among us that it is impossible to pronounce decidedly upon their power to permanently improve our native stock. But they certainly deserve a fair trial; and bulls of this family are doubtless far superior to the miserable native mongrels so commonly employed by our farmers.†

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* The bull "Young Favorite," owned by E. G. Alden, Esq., of Boston, and kept in the vicinity of Taunton.

† Mr. Grinnell, of Dartmouth, is the owner of a young bull, "Potomski," seven-eighths short-horn and one-eighth Alderney. He was bred by Mr. Rodman, and comes of superior milking stock.

The farmers of Bristol County, in common with their brethren throughout the country, have had few opportunities to make themselves acquainted with the excellences of the Alderney; but as several gentlemen about New Bedford have become interested in this breed, and there is a probability that at no distant period the blood will not be uncommon in the county, it is proper to call attention to them in an article which purports to point out the materials for improvement existing in our midst. The Alderney cattle are natives of Jersey and the Channel Islands, where they have been bred from time immemorial. They are very small; usually of a fawn and white, or brown and white color; though animals nearly black are not unfrequent. If we except a bright eye, delicate muzzle, and a sharp little horn, which give them a certain game look, these raw-boned little creatures can hardly be deemed beautiful. Probably four out of five of our farmers unacquainted with their merits would pass them by with derision, regarding them as ridiculous monsters in ugliness, if not in size. But let any one of these farmers behold a few pans of Alderney milk upon which the golden cream had risen, or spread upon bread the delicious butter made by his thrifty wife from that same cream, and these little cattle will be clothed with a beauty that the eye alone was unable to discover.

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* It is notorious that well-bred short-horn bulls are to be found on the estates of the Ayrshire breeders in Scotland, confessedly for the purpose of getting stock for the butcher. Their presence on such estates must have the effect of strengthening the faith of those who question the claims of the Ayrshire cattle.

† Colonel Page, of New Bedford, has a full-blooded Ayrshire bull of the Randall stock; and Jonathan Tripp, of Dartmouth, has a handsome grade Ayrshire from the blood of the Cushing importation.

The Alderney cattle have always, as far back as their history extends, maintained an unrivalled reputation as producers of delicious cream, from which is made the finest butter. It is said that, wherever they have been introduced, these cattle have never failed to sustain their home reputation. Their yield in milk is never very large; but the milk is always exceedingly rich, producing rarely less than twenty-five, and often thirty-five, per cent. of rich cream, always of a deep golden hue. For a long period Alderney cows have been kept upon the estates of the nobility and wealthy gentlemen in England, to supply the tables of the proprietor with cream and butter of the finest quality; but they have never been kept in any considerable numbers by the farmers, who have found other breeds more profitable. Latterly, however, dairy farmers have become satisfied that they were doing well in giving a strain of this blood to their milking herd. Many years ago small importations of Alderney cattle were made into the United States, and their descendants are still known and appreciated. Within a few years these importations have been numerous, and we can now, by personal observation, test their good qualities. In 1851, Mr. Thomas Motley, Jr., of Jamaica Plain, was sent abroad by the Massachusetts Agricultural Society for the express purpose of selecting Alderneys to be introduced among the cattle of the State. How well he executed his mission, may be seen in the herd now under his charge in West Roxbury. These animals are, by and by, to be distributed among the county agricultural societies of the State for the use of the public; and they cannot fail to prove of great value. Mr. John Wood, of New Bedford, exhibited a fine cow and calf of this breed at the recent cattle show. These were imported for Mr. Wood by that well-known stock breeder, John A. Taintor, Esq., of Hartford, and are, doubtless, superior specimens of the breed. We had reason to regret that the confusion attending a crowded and ill-arranged show ground prevented many from giving these interesting animals the examination they deserved; and we regret, too, that Mr. Wood failed to give us the result of his experience thus far in the value of his stock. Another year, we trust, will remedy these defects; and we cannot doubt that the lactometer and the churn of Mr. Wood will tell a story that will astonish the "natives" and their uncompromising advocates.* As a cross, the virtues of the Alderney are conspicuous in the richness and yellow color imparted to the milk. This improvement is observed even in remote connections—a convincing proof of the long establishment of this quality as a characteristic of the race, and of the certainty we may feel that the distinctive features and excellences of thorough-bred animals will be impressed upon their descendants.†

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* Mr. Motley's imported Alderney cow, "Flora," made five hundred and eleven and three-fourths pounds of butter from May 10, 1853, to April 26, 1854. For three consecutive weeks in June she made fourteen pounds of butter per week, never giving over fourteen quarts of strained milk in a single day. For several weeks she made an average of one pound of butter from five quarts of milk; and even a little less has made a pound of butter.

Mr. Motley found that, in a herd of thirteen cows,—one short-horn, one Ayrshire, two half-breed Alderneys, and nine full-breed Alderneys,—an average of seven and a half quarts of milk made a pound of butter in the month of November; feed, hay and one peck of carrots per day.

One Alderney cow made six pounds of butter in a week, in March, nine months after calving. A four-year-old heifer, of the same breed, made in the month of April twelve and a quarter pounds of butter three weeks after calving. She gave milk to within thirty days of calving, and never less than three quarts per day.

These are facts, and speak volumes in favor of the Alderney when we remember that animals of this breed are very small, and consume but little food compared with the larger breeds.

† Mr. Rodman's cows have never lost the evidence of their partial descent from the Alderney, though many of them have now but a remote relation to that stock.

We have now passed in review the native, Devon, short-horn, Ayrshire, and Alderney breeds of cattle, with such reflections as their adaptation to the wants of our Bristol County farmers seem to demand. We have pointed out, as briefly as possible, the distinctive characteristics of each breed, that all who desire to improve their stock may know to what source they must turn to impress upon their herds certain desired qualities. We think we may say with confidence, that the statements we have made may be verified by reference to the stock-breeding literature every where available, and to the practical experience of stock men of established reputation.*

Before closing, we desire to make one practical suggestion to the farmers of our county. Few of us are wealthy enough to purchase high-priced bulls of the best breeds; but that is no reason why we should continue to resort to the miserable mongrels, of no earthly merit, that are so common in every township. In sections where no good bulls belonging to private individuals can be used at moderate price, what is there to prevent the formation of clubs for the purchase of desirable animals? Ten or a dozen farmers can easily raise their proportion of the cost of a good bull, to be used by themselves or let to their neighbors. It costs but little more to keep in good order a well-bred animal than it does to maintain a worthless beast; while the effect upon the stock of the neighborhood will more than repay the extra cost of keep and attention, and return a handsome interest on the investment. We recommend this course emphatically to our brethren in the county, as worthy of their serious consideration.

In conclusion, we desire to congratulate the members of the Bristol County Agricultural Society upon the success that crowned their exertions to render the recent cattle show one of unusual interest. That it did surpass all previous meetings of the society, in the quality of the stock upon the ground, in the attendance of an interested multitude, and in other novel and interesting features, is conceded on all hands; and this fact is in itself an ample reward to all those who, in various departments, gave their time and energy to the arrangement and accomplishment of its details. But, while we have good reason to be pleased with this result of our past labors, we must not close our eyes to the duties which this very success imposes upon us. We have, as it were for the first time, become conscious of our own power. We have developed our resources, and ascertained the abundance and excellence of the materials within our reach. Shall we fail to avail ourselves of these advantages? or shall we demonstrate to the world a determination to press forward in the work of improvement until we reach a point of excellence commensurate with the blessings by which we are surrounded?

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* For interesting and very valuable articles upon stock, and indeed upon every branch of agricultural economy, we desire to recommend the "American Agriculturist,"—a weekly publication, conducted by Messrs. A. B. Allen & Co., of New York,—the editors of which are not only scientific but practical farmers. Indeed, valuable information on this subject may be obtained from almost all the northern farming papers, one of which at least should be in the hands of every intelligent farmer.

CHRISTOPHER A. CHURCH, *Chairman.*

BULLS.

ESSEX.

From the Report of the Committee.

There were seven entries of bulls of foreign breed, viz.: three of the Jersey, or Alderney, and four of the North Devon. Of Jersey, one by Richard S. Rogers, of Danvers, seventeen months old, from the stock imported by the late Daniel Webster; and two by George H. French, of Andover, one sixteen and the other fourteen months old. Of North Devons, one by Charles Harriman, of Groveland, three years; two by A. P. Bateman, of Georgetown, one two years and the other one year old; and one by Charles Nelson, of Georgetown, for exhibition only. All were judged fair specimens of their breed, and gave much interest to the show of cattle. The first premium being confined to bulls of foreign breed, brought up the question, which of the two breeds was to be preferred for general use in this county. The Jerseys were all young, not of mature age, and the committee did not presume to judge whether they were superior specimens of that breed. There were four cows in an adjoining pen, from Mr. French's stock, which seemed well to sustain the high reputation of that breed for their milking qualities. The thanks of the society are due to the gentlemen who have introduced this stock into the county and given us an opportunity to examine them this day. Aside from their milking qualities, they do not seem to possess the other requisites for general use. They have not sufficient bone and muscle for labor; nor does it seem that, when well fed, the butcher would find as many good pieces as in some other breeds.

DEAN ROBINSON, *Chairman.*

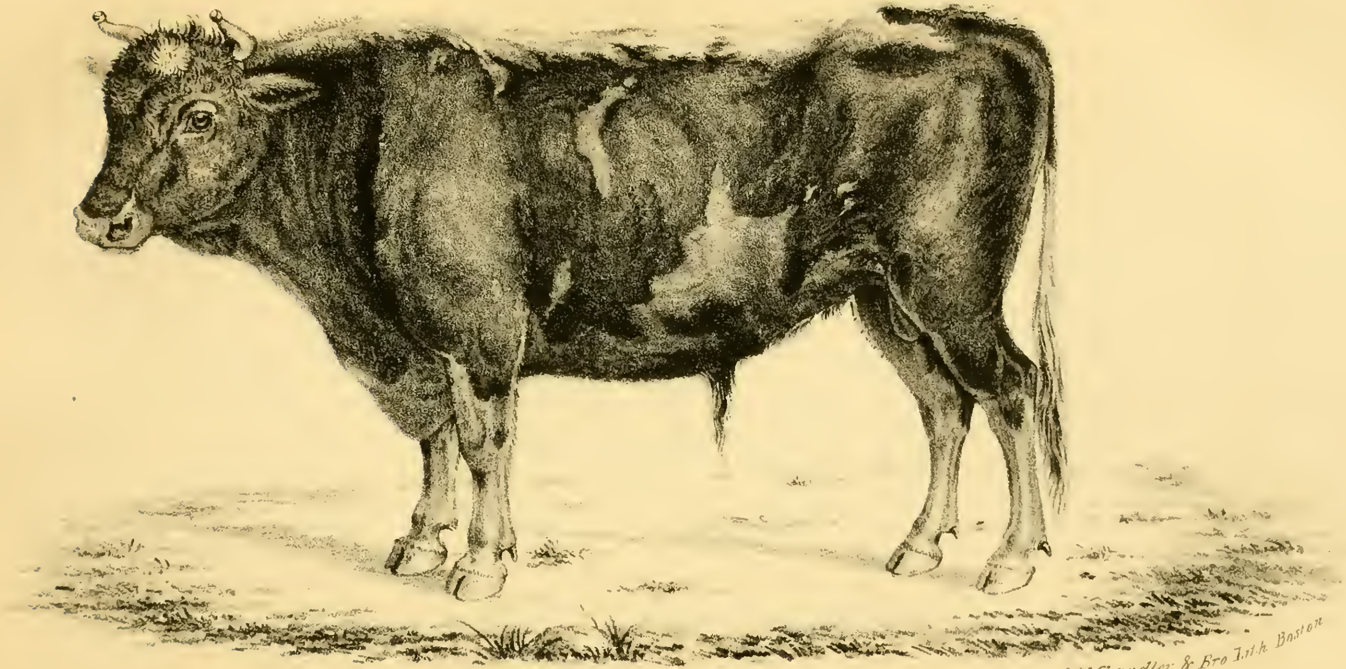
MIDDLESEX SOUTH.

From the Report of the Committee.

The committee beg leave to suggest a few practical hints in relation to our farm stock, that our farmers may become aware of the great loss that is suffered by us all yearly for want of a better system, or rather a system, for there seems to be no system at present with most people in regard to this subject.

It becomes us, in the first place, to discard all those refuse bulls which the stock growers of Vermont and other States are ashamed to have with their herds, and so have sent to our markets, to be picked up by the penny-wise farmers of our State, to be associated with our herds. When we demand a better kind of stock, stock growers of other States will be compelled to furnish it.

It is well understood that the issue of any class of stock depends on the sire more than on the dam; so that, with proper regard to the blood of a certain class, or any class, a system can be brought about which shall be perfectly adapted to the various purposes of our farm stock, whether it be for the milk dairy, butter dairy, veal, or beef, or all combined. Every farmer with a herd of cows depends more or less, as a source



S K Chandler & Bro Lith Boston

PRINCE FULL BLOOD JERSEY.

Owned by Richard P Waters, Esq Beverly
Sired by "EMPEROR" imported by J A Taintor
of Hartford Conn   4 Years old in June 1855

of profit, on his veal calves; but how unpardonably, in this section, has this part of our interest been neglected by our farmers, for the saving of a few cents in the outset, in keeping such ugly specimens of the race to herd with their cows! If none of the pure bloods are best adapted to this particular, let us try for the best cross with our native stock; and then let our society, in their annual exhibitions, regard and encourage such a cross, if it prove to be adapted to the purpose intended, and not otherwise. If our farmers are disposed to think and experiment in this matter like our English cousins, we can breed as correctly as they; for it is as true in this department of Nature's laws as in any other, that whatsoever we sow, that shall we also reap.

ELIAS GROUT, *for the Committee.*

HAMPDEN.

From the Report of the Committee.

The committee to whom was referred this class of animals report that sixteen entries were made, only eleven of which, of one year old and upwards, came under their notice. This very important, and what ought to be every where a prominent, department of agricultural interest is, in the opinion of the committee, too much neglected by the farmers of Hampden, especially in the production of pure, high-bred animals. It is a well-known fact among growers of fine stock, particularly in England, that, to obtain the best, the sire should be a pure, thorough-bred animal, as calves from one of an opposite character almost invariably show the defects of an imperfect pedigree. Another fact, equally well established, though it may appear strange to some, is, that calves frequently possess the distinctive traits of character which obtained in the animal that first impregnated the heifer. These, and many equally important facts, render it of the first necessity to obtain thorough-bred animals for the improvement of stock, either for dairy purposes, or for the rearing of that noble animal, the ox, so indispensable for farm service. Owing to the exceeding high prices which dairy products and cattle for slaughter now command, the importance of producing stock that shall be free from all mixture claims our immediate and earnest attention. The committee are gratified in the assurance that some of our enterprising stock growers are already on the right track, and they hope ere long to find many more emulating the example.

The show of bulls on the present occasion was, with some exceptions, rather inferior to that of last year. Of the animals present with their credentials, and subject to the committee's examination, there were only three. A beautiful two-year-old Devon bull, sired by Norfolk, of the Massachusetts Society's stock, was exhibited by D. Brainard Merrick, of Wilbraham, and bids fair to improve his race. Another of the same breed, and one that has contributed to the interest of former exhibitions, was shown by H. M. Sessions, of South Wilbraham. The greatest attraction in this class of animals, and one which bore away the palm, was a magnificent Durham bull, (see *ante*, page 253,) four years old, from the celebrated stock of Mr. Vaille, of Troy, N. Y., and exhibited by Paoli Lathrop, of South Hadley, and owned by him and George M. Atwater, of Springfield. This bull, being descended directly from an imported pedigree, shows us at a glance the vast superiority of English stock as compared with our own, and should stimulate us to immediate effort, in order to obviate, at the earliest possible moment, the necessity of importing *John Bull's* bulls. The thanks of the society are due to Mr. Lathrop for his trouble in exhibiting this animal; and under its provisions for encouraging the introduction of imported stock, we think him entitled to the first premium on Durham bulls. A very fine red bull of the Ayrshire breed, three years old, and of mammoth proportions, was shown by Royal Rindge, of Wilbraham. Another, deserving of commendation as a mixed breed, was exhibited by William Pynchon, of Springfield; also another by Daniel Prince, of West Springfield; nor should we omit to mention the city bull, which has headed the list in two preceding exhibitions, and therefore could not be justly entitled to further award.

H. E. MOSELEY, *Chairman.*

NORFOLK.

From the Report of the Committee.

The committee are happy to report that there was, in the present exhibition, a marked increase over that of any former year in the number, as well as improvement in the character, of this class of animals. By a rule of the society, only such animals as are of pure blood are allowed to be competitors for a premium. Of the wisdom and justice of such a rule there are undoubtedly different opinions. This rule was not adopted, however, without consideration; and an adherence to it, at least for the present, seems to be justified by the character of the stock exhibited to-day. Our pens were never before filled so largely with fine specimens of the Ayrshire, Devon, Durham, and Jersey breeds. Of the Devons and the Jerseys, in particular, there were several animals which attracted the notice and commanded the admiration of every visitor.

An impulse has now been given to the improvement of stock in this county which it is of the greatest importance to encourage. Whether this can be done most effectually by introducing extensively the best foreign breeds, or by causing a more careful and judicious selection from our native breeds,—though not a matter of doubt with the majority of the committee,—is questioned by many intelligent farmers. Certainly there are instances enough in proof of the benefit of judicious crossing of the native and foreign breeds to authorize continued endeavors on the part of the society to enlarge their number, by awarding premiums only to the best bulls of strictly pure blood. Where such crossing is practised, as well as where only animals of pure blood are kept, improvement is observed at once, both in the character of the dairy and of the calves fattened for slaughter; and this improvement is sufficient to show the absurdity, on the score of profit, of the common mode of selecting and rearing stock. Whether it may not be expedient to encourage, at a future day, the crossing of different breeds *upon a more extended scale*, by offering premiums for the best grade bulls, is a point worthy of discussion. To many there seems to be no good reason why a race may not be propagated, by careful selection from our native breeds, or by judicious crossings, which shall be better adapted to our climate, soil, and keeping than is any purely foreign breed; no good reason why, if England has her Devons, Durhams, and Herefords, and Scotland her Ayrshires, and Ireland her Kerries, and Jersey her Alderneys, *which are worth importation at enormous cost*, America may not have a breed of peculiar form, size, beauty, and excellence, adapted to her peculiar climate and soil—*home-bred*, and therefore better fitted for *home-keeping*. We hope that profitable suggestions upon this whole subject may hereafter be given to the society by some one whose experience and study shall lend authority to his words.

Meanwhile we would encourage the REARING *of the best classes of stock* upon the farms of Norfolk county, confident that such stock may be kept here more easily and with better results than any which is purchased elsewhere.* At the same time we would insist that the utmost care and attention should be bestowed on the *selection and rearing* of all stock. We sometimes hear it said that *a bull is a bull*, and that any chance offspring is as good for the farmer's stock as that of the best selected breed, whether of pure or mixed blood. Such a belief, and the practical conclusions drawn from it, must forever prevent the improvement of the dairy and the comfort and profit of farming.

Mr. Coleman remarks, in his European Agriculture, that the "South Devons," which he distinguishes by very marked difference from the beautiful "North Devons," "are animals indentical with the great mass of cattle to be found in New England." "In respect to them, as far as I could learn, no particular pains have been taken to improve their breed, and to see what could be made of them, as in the case of the short-horns, the Herefords, and the North Devons." May not this remark be made, with equal fitness and force, respecting the mass of the cattle now in New England? And in the beauty and excellence of the fine North Devons, Durhams, Ayrshires, and Jerseys exhibited to-day, have we not sufficient encouragement to attempt the improvement of our native breeds in a rational way?

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* Animals are wont to thrive better at home than from home. The most celebrated foreign breeders are said to "do much better in their own locality than when removed."

Charles C. Sewall, *Chairman.*

MILCH COWS.

ESSEX.

From the Report of the Committee.

The committee were pleased to find so many competitors for these premiums; but they were sorry to find so few of them giving full and particular statements in regard to the produce and feed of the cows. It is desirable that claimants for these premiums should furnish the society with a full and accurate account, not only of the food given, but the particular manner of feeding. We are aware that the rule requiring statements of the produce of particular cows has given those who keep but one or two cows a better chance for obtaining the premiums than those which keep a large number; for it is not only more convenient for those which have but one cow to keep an account of the produce, but a cow that is kept alone will produce more than she will when she goes in a large flock. Why it is so, we are not wise enough to say. However social the cow may be in her disposition, she proves that she is no socialist, for she produces more when alone than when in a community.

The committee were pleased to find in the pens a lot of Jersey cows, exhibited by George H. French, of Andover. Whatever difference of opinion there may be in regard to the different breeds of cattle, we trust every member of the society and every friend to the advancement of agriculture will feel grateful to Mr. French and other liberal individuals, who are disposed to bring among us the best cattle of the most approved breeds of other countries. It gives, in some good degree, to each one of us an opportunity to compare the merits of the different breeds of cattle. While on the one hand we would guard against neglecting our native cows, and lavishing our care upon an imported breed, which in the end may prove far inferior, yet we would deprecate the confident spirit which some manifest in saying that our native cows cannot be beaten; for this spirit, if indulged, would put a check upon the improvement of our milch cows. Let those who are disposed, import and rear their favorite breeds, and give the result of their experiments to the public; and if they should fail to meet the importer's expectation, the individual loss would, in some measure, be a public gain.

From whence shall the farmers of Essex County obtain their cows, is a question that is becoming every year a more important and difficult one to settle. In former years we have been able to buy two-year-old heifers, from the droves from Maine, New Hampshire, and Vermont, cheaper than we could raise them; but the comparative value between veal calves and two-year-old heifers has altered much since railroads have come into use. A few years since we could buy the best of heifers from the droves in autumn for about twice the price of a good veal calf in the spring. Then it was better for us to buy heifers than to raise them; but now we find but few good heifers in the droves. Either they are not sent here, or the high price of beef has caused the butchers to get the best of them; so that all we get are those whose hides are so close to their ribs that the butchers dare not attempt to separate them. If this state of things continues, we shall be obliged to some extent to raise stock in this county.

It may be well for us to consider the merits of the different breeds of cattle, and see if any can be found better adapted to our wants than those commonly called "native cows." Although there are many individuals among them of superior milking qualities, yet where is there a flock of native cows from which we could raise their calves with any degree of certainty that their offspring will possess the milking properties of the parents? From the imported stock which has been long and thoroughly bred we may raise stock with some such certainty. It may be asked, What have the Jersey cows to recommend them? There is nothing in their size, form, color, or external appearance, that would captivate any one. From what we have seen of them when well fed, we should think that if a flock of them were kept in our dry, bushy pastures in summer, and then exposed to the severe cold of our winter, fed on as poor fare as many of our native cows get, they would be as ill-shaped, ghastly-looking animals as could well be imagined; and if he who, in his dream upon the banks of the Nile, saw the ill-favored and lean kine rise up before him, could, when he awoke, have seen a flock of these cows, he would have said that it was no dream, but a living shadow. But if upon a fair trial we find them giving better milk and making more butter in a year than any other breed upon the same expense of feeding, we shall learn to judge, not by the outward appearance, but by their real merits.

There are some objections which may be raised against them; they are not so valuable for beef, and their calves for veal will not be so good as some other breeds. It is said by the importers of this breed that they continue to give milk all the year. It may be desirable for a family cow to have one that will give milk all the year; but upon a farm, either for making butter or selling milk, if we can have the same amount of milk in eight months as in twelve, we should prefer the cow that would give it in eight months, and go dry the other four months, for the expense of feeding is less when dry.

In the statements which we have of the cows exhibited, the owners have said but little of the quality of the milk—a point that needs more attention from those farmers who make butter.

We have often heard the remark, that a cow gives good milk because she had a fat calf. Our experience has led us to think that the calf is no criterion by which we may judge of the butter qualities of the cow, for we have known many cows that had fat calves which made but little butter. If any one will carefully notice the milk in a lactometer, he will find a great difference in the appearance of the milk of different cows after the cream has risen. One may have a thick, yellow cream, and the milk at the bottom will be thin, and nearly as blue as the sky; while another may give but little cream, and the milk will be nearly the same color. Thus we see that the milk of a cow may be good for fattening the calf and for family use, and yet not raise a thick cream; and hence we see that there is some truth in the remark which we sometimes hear, "that my cow's skimmed milk is about as good as my neighbors' new milk." It is only by careful attention to these points that we can select and rear a stock of cows that will be adapted to our wants.

WM. R. PUTNAM, *Chairman.*

Statement of John Perkins.

I present for examination a "native" cow, five years old. I have owned this cow three years. She had her third calf the 19th of last March. From that time to the present she has given two thousand four hundred and eighty-four quarts of milk. I have measured her milk morning and night, as I sold it to my neighbors. It is of good quality. Her feed has been good hay and eight quarts of shorts per day; when turned out to grass, four quarts of shorts per day.

In June she gave fifteen quarts per day; she now gives ten quarts per day. She would not go dry at all if I continued to milk her; but it was thought best to dry her about four weeks before calving.

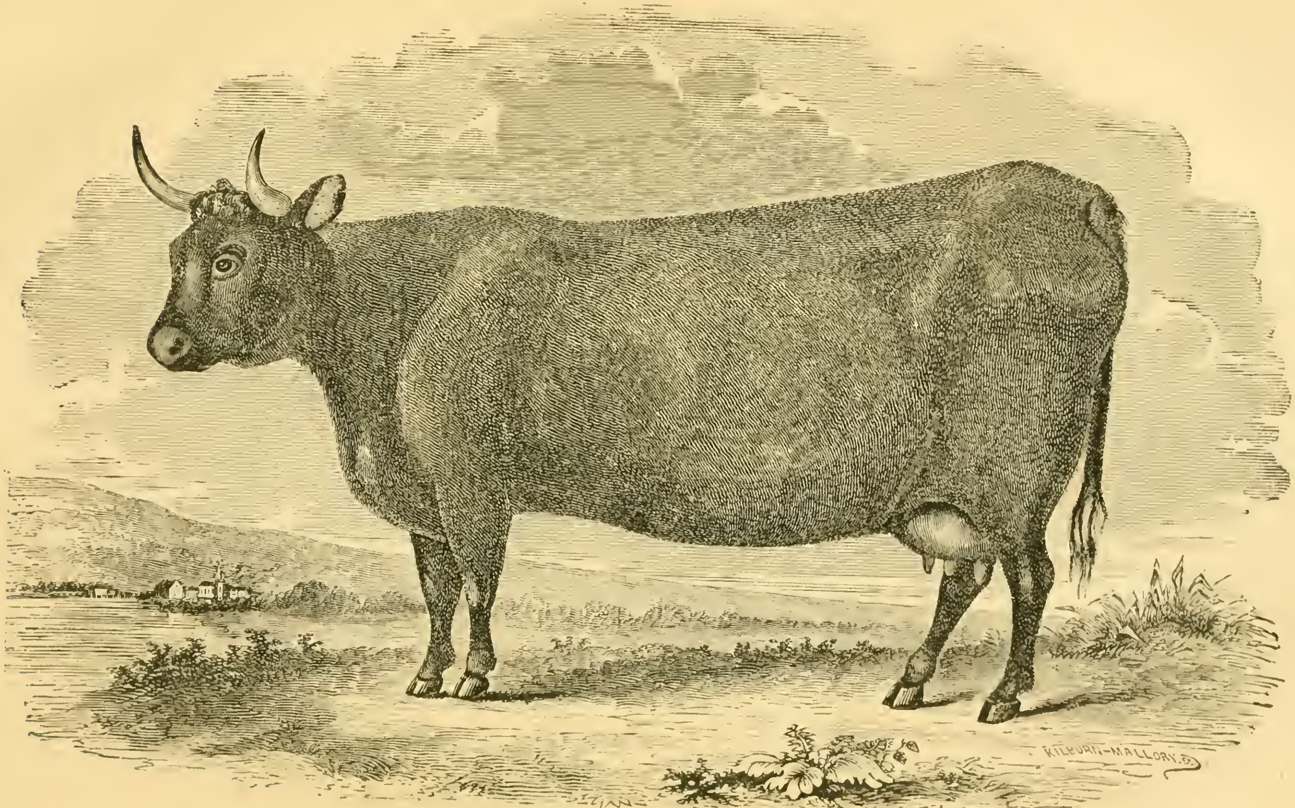
DANVERS, September 27, 1854.

Statement of Lorenzo Dow.

The average yield of milk per day from the cow presented for premium for each month, commencing the 1st of March, was as follows:—

Average for March,	. . . .	11½	quarts per day.
" " April,	. . . .	12	" " "
" " May,	. . . .	13½	" " "
" " June,	. . . .	16	" " "
" " July,	. . . .	15½	" " "
" " August,	. . . .	12	" " "
" " September, thus far,	.	12½	" " "

I set seventeen and one-half quarts of milk, and churned the


KILBURN-MALLORY SC.

OAKES' PRIZE COW. [See Page 253.]

cream from the same, and it yielded three pounds of nice butter.

METHUEN, September 26, 1854.

Statement of Eben G. Berry.

I offer for premium four cows, from six to eight years old, that have been in my possession more than three years; each of them has given milk more than one year, and all will be in new milk again in November and December. When in new milk in the spring, two of them have made ten pounds of butter each per week, in the month of June. Either of them will make eight pounds during the same time. With the exception of this month, their milk has been sold daily through the year. Three of them will give milk through the year, and one will go dry ten weeks. Their feed is grass only, and the product of their milk this day is as follows: first, six quarts; second, five and one-half quarts; third, four quarts; the fourth being dry. The greatest quantity of milk for any number of weeks is, first, sixteen quarts; second, fourteen; third, thirteen and one-half; fourth, fifteen quarts per day.

The fourth cow is the most strongly marked for a model as I understand Guenon's theory, but is the poorest of the lot in all respects.

NORTH DANVERS, September 26, 1854.

MIDDLESEX.

Report of the Committee on Dairies.

It was a general remark, as well by the visitors as in the committee, that the exhibition of cattle this year was much inferior to that of the last and of the several preceding years. No doubt this was owing to the effect of the severest drought ever remembered in the country, which in many towns cut off the common and by far the best food of the cattle, reducing their yield of milk, and severely injuring their appearance. Ample and well-watered pastures seem to be essential to the production of the best and largest quantity of milk and butter, and equally so to the health of the cow. Soiling, feeding out grains, &c., can seldom be resorted to with profit when the farmer has at his command sufficient pastures for his cows to range over and feed at will. It is to the above cause, no doubt, that the liberal premiums offered by the Massachusetts Society for Promoting Agriculture failed to bring out the show of stock that our society confidently hoped to have seen at this exhibition. Let us hope that the effect of these premiums which are to be offered, until they are awarded, will another year be such as to satisfy the expectation of the public, and as to induce the trustees of the Massachusetts Society to repeat them. We may mention in this connection that the same society has decided to extend premiums of similar amount, to such other county societies throughout the Commonwealth as have not already received them, the next year, and the large sum of twelve hundred dollars is to be competed for under the auspices of the Worcester Society, at Worcester, by all the counties in 1856.

There were *five* dairies of cows offered this year for premiums. One of these, Mr. Buckminster's fine herd of Devons, was decidedly admired by every observer, but could not be considered by your committee, because the proprietor failed to make any statement of its history or products as required by the regulations of the society. Four other gentlemen also exhibited cows, but as they, with one exception, also failed to comply with the regulations prescribed by the society, the committee could not consider them in reference to premiums, however well they might be thought to merit them. Only one of these dairies produced butter—that of Mr. A. G. Sheldon, of Wilmington. His carefully prepared statement was read with interest and profit; but, in the opinion of the committee, the produce was not sufficiently large to entitle him to a premium. It will be seen that for his butter, which is certified by competent judges to have been of the finest quality, he received only thirty cents per pound, although prepared in the best manner, and laboriously stamped. This should not be so. Many consumers in Boston pay from forty to fifty cents a pound, besides in some instances paying expenses by express from Philadelphia, for butter no better, to say the least, than his. If he, or others who feel a just pride in producing the best butter, would also take a little pains in marketing it, they would be more justly paid for their exertions. His cows are all described as "*natives*." We suggest to him to add one Alderney to his herd. Her cream will give *color* and *character* to his butter, and enable him to advance his prices from one-third to one-half in a market where it would be appreciated, and where there is a demand far exceeding the present supply. Mr. Viles, of Waltham, exhibited a dairy of eight cows, partly natives and partly *grades* of Ayrshire. His account of their produce was truly extraordinary. The dairies of Mr. John B. Moore and of Mr. George M. Barrett, of Concord, were of a high order, showing well-selected stock and great production of milk.

And here we may be allowed to express some doubts whether the statements of extraordinary produce of cows, as given by amateurs in the public prints, and which sometimes find their way into agricultural reports, have not done something to discourage the efforts they are intended to stimulate. In a late number of the journal of the Royal Agricultural Society of England there is a communication from Col. Le Couteur, of Jersey, giving the produce of his celebrated prize cow "Beauty," and of several others of the best specimens of the Jersey or Alderney cows. He says that "Beauty," in her best milk, yielded eleven pounds thirteen ounces of butter a week from one hundred and thirty-three quarts of milk, (nineteen quarts a day,) being a pound to about eleven quarts. Some of the other cows gave twenty-six quarts of milk a day for a short period, and fourteen pounds of butter a week, or a pound to thirteen quarts of milk.

This contrasts strangely with the frequent statements made of the products of the same breed of animals here. From four to six quarts of milk, it is often said, give a pound of butter; and these statements come from parties whose accuracy and truthfulness no one can for a moment doubt. But what are the circumstances? Is this extraordinary amount of butter made soon after the dropping of the calf and on good pasturage only? or is it made from *farrow cows*, or the *strippings* or morning *messes?* and are the cows highly fed with stimulating food? No doubt these statements, made sometimes without all the details necessary to make them well understood, have had a serious effect on the competition for our prizes. Would it not be well to make it a condition that cows offered for premium shall in the *trial months*, say from May to September, have no other feed than pasturage and green fodder? Without such a general rule, it is to be feared that there can be but little fair competition, and that many people will decline it altogether for whose advantage it is especially proposed. In this department, as well as others, careful readers cannot fail to observe that amateur, and not practical, farmers generally bear off the prizes, to the disappointment, and often permanent disgust, of less-favored competitors. These gentlemen amateurs would add greatly to the obligations they have already laid the community under if they would enter their fine stock for exhibition only, and leave the prizes to parties to whom they are a pecuniary object as well as a proper ambition.

The committee have observed with great pleasure the successful efforts of many gentlemen in the county to introduce the best foreign stock to their neighbors and the public. Already the effect is obvious to the observer when passing over the county in any direction. Fine cattle of the Jersey, Ayrshire, Devon, and Durham breeds are often seen mingled with the best native stock. Much of this improvement is also to be attributed to the "Massachusetts Society for Promoting Agriculture," which has with well-conducted liberality placed bulls of various breeds in different parts of the Commonwealth for public use.

JAMES BROWN, *Chairman.*

MIDDLESEX SOUTH.

Statement of Obed Winter.

The cow I offer for premium brought a fine heifer calf the 10th of March last, which took one-half her milk, and at five weeks and three days old was sold for over eleven dollars for veal.

The first week in June she gave one hundred and twenty-nine and one-half quarts of milk—average, eighteen and a half quarts per day. I sold and made use of one-half the milk; the other half made eight and a quarter pounds of butter, being sixteen and a half pounds per week. The average weight of milk was forty-seven pounds per day.

The first week in September she gave ninety-one quarts—average, thirteen quarts per day. One-half the milk made six and a half pounds of butter, being thirteen pounds per week.

She went to pasture about the middle of May. The first week in June I gave her one quart of meal per day only. In September I fed her with corn fodder, and no meal.

The milk used for butter was about the same proportion of night and morning milk. I found in June eight quarts of milk made one pound of butter; in September, seven quarts made the same.

The average quantity of her milk through May was sixteen quarts per day; in June, eighteen quarts per day; in July, sixteen quarts per day; in August, fourteen quarts per day; in September, thirteen quarts per day. The whole number of quarts she has given from the 10th of March to September 25 is two thousand six hundred and one, besides what the calf took.

Framingham, September 26, 1854.

Statement of Abiel S. Lewis.

I offer for your consideration my half Ayrshire and half Jersey cow, Victoria, five years old. She calved in March. Her product for ten days in June was three hundred and seventy pounds of milk, and for ten days in September two hundred and eighty-three and a half pounds of milk, which yielded one pound of butter to fourteen pounds of milk.

My Durham cow, Eugenia, six years old, calved in April. Her product for ten days in June was four hundred and five pounds of milk, and for ten days in September three hundred and three and a half pounds of milk, seventeen pounds of her milk making one pound of butter.

My three-quarters native and one-quarter Devon cow, Rosa, four years old, calved in March. Her product for ten days in June was three hundred and four and a half pounds of milk, and for ten days in September two hundred and three pounds of milk.

My Ayrshire cow, Fanny, three years old, calved in August, 1853. Her product for ten days in June was two hundred and sixty-one pounds of milk, and for ten days in September one hundred and forty-six pounds of milk. She is to calve again in December. My imported Hungarian cow, Briska, averaged twenty-five pounds of milk per day in September. My Hungarian heifer averaged sixteen pounds of milk per day in September.

The only feed my cows have had is very poor pasturing, with some corn stalks at night in September.

WORCESTER.

From the Report of the Committee.

We feel gratified to be able to state that a gradual improvement is visible, and that that spirit which incites the farmer to the amelioration of the cow continues to grow stronger.

In connection with many fine features we noticed one fine lot of cows, twelve in number. This collection was introduced by our secretary, Wm. S. Lincoln, Esq. They were not offered for premium, but for exhibition. Mr. Lincoln informed us that it was his intention, originally, to offer these for premium, and took them under his immediate supervision and regularly milked them for a time; but unfortunately his hand became disabled, when he was obliged to give up the charge; and as his motive was that of the true Yankee, "either to hold the plough or drive," he relinquished his first intention.

We also noticed several of the Alderney breed, whose superiority consists in the richness of their milk. For the introduction of this valuable stock your society are greatly indebted to the exertions of our esteemed fellow-citizens, Hon. Stephen Salisbury, and Payne Aldrich, Esq. There were five exhibited. The two belonging to Mr. Salisbury were of his own importation at great trouble and expense. The one owned by Thomas

Drew was purchased at Marshfield, being a living memento of that lively agricultural interest which was ever evinced by its former owner, the lamented Daniel Webster. The two owned by Mr. Aldrich were purchased by him in New Jersey—one of which, called Asia, was the recipient of the first premium at the New York State Fair in 1852. The other, called Duchess, since she has been in the possession of her present owner, gave, in six successive days, eighty-four quarts of milk, being an average of fourteen quarts per day, which produced twelve and a half pounds of butter, averaging one pound of butter to seven quarts of milk. Mr. P. Aldrich informed us that the milk from these cows sells readily for twelve and a half cents per quart for particular uses. Your committee would recommend the Alderney breed for family use, but in no case to form a part of a dairy where the milk is sold; for we entertain strong fears lest the worthy introducers of the Alderney would receive it as an insult, inasmuch as our city brethren do strongly hint that the milk which they receive is indissolubly associated with the pump and powdered chalk. Surely it would be disrespectful to Nature to adulterate milk of such rich qualities. It is the opinion of Messrs. Salisbury and Aldrich that a crossing of this breed with others would produce a stock superior in all respects to any yet known.

Messrs. Harvey and Nathaniel Dodge, of Sutton, whose deep interest in the prosperity of our society has been manifested at our former shows, exhibited a fine specimen of the Devon. Mr. Harvey Dodge exhibited one full and one half blood—Mr. Nathaniel Dodge one full blood. This breed is a perfect model of beauty and symmetry, and compares favorably with other breeds in quality and quantity of milk.

The following named gentlemen offered for premium some fine stock: Amos F. Knight, of West Boylston, one one-half Ayrshire, seven years old; Rufus Holman, of Leicester, one native, four years old; Gorden Woodward, of Leicester, one one-third Durham, four years old; Joseph P. Reed, of Princeton, one one-half Ayrshire. All of the above were fine looking, and presented a noble appearance, and, judging from the external qualities, were all good milch cows. Your committee exceedingly regret their inability to award a premium in each of these cases; and we would respectfully recommend that the unsuccessful competitors, and those who offered for exhibition, be allowed compensation for travel.

We would here say that we have dwelt more particularly in our comments upon the Alderney on account of its being a stock unknown in this community until quite recently.

The show of 1854 is rendered prominent by many desirable features which are convincing proofs of the ability and good will of our young men.

OTIS ADAMS, *Chairman.*

Statement of William Robinson, Jr.

My dairy consists of sixteen cows—fourteen new milch, and two farrow. They are of all grades of Durham breed, from one-fourth to three-fourths, and their ages are, respectively, one nine years; one, eight; three, seven; six, six; three, five; one, three; and one two years old. They were mostly raised by me. Of the five offered for premium, three were raised by me, one by David Lee, and one by Elias Ayres. The first cow dropped her calf on the 28th of March, and the last on the 18th of April. The calves were all raised. One was a bull, and sold at two days old for ten dollars. The others were heifers of a superior character. They were dried in February, and two of them will calve in March, and the other three in May. They were turned out to pasture on the 8th of May, and fed with hay night and morning till the 15th. Two quarts of corn meal per day were fed to them, and corn fodder twenty-three days.

The following table shows the weight of milk:—

For the first ten days in June, . .	$2{,}107\frac{3}{4}$ pounds.
" " " in September, .	$1{,}440\frac{1}{16}$ "

I made two hundred and twenty-one and a quarter pounds of new milk cheese from the milk of the five cows in the first ten days in June, and one hundred and fifty-five pounds in the first ten days in September. No milk was sold or used. We made, from the time of turning the cows to pasture till September

12, four thousand nine hundred and two pounds of new milk cheese. Sixteen hogs fed on the waste of the dairy till August 1; since then they have had fifty bushels of provender. I have made during the season six thousand nine hundred and thirty-five pounds of cheese, and have sold three calves, from two to ten days old, for thirty-two dollars.

BARRE, 1854.

Statement of William W. Watson.

The cow offered for premium gave the first ten days in June thirty-five pounds of strained milk per day, and it made twenty pounds of butter. The first ten days in September she gave thirty-four pounds per day, which made fifteen pounds of butter. The milk was all put into skim-milk cheese.

I offer for premium also six other cows, one of which is exhibited. They gave thirty-two pounds of milk each a day the first ten days in June, and made ninety pounds of butter. The first ten days in September they gave twenty-two pounds each a day, which made seventy pounds of butter.

In June, July, and August I kept the morning's milk twenty-four hours, and the night's milk twelve hours. In five months the six cows made one thousand four hundred and ninety-seven pounds of skim-milk cheese, which has been sold so as to average seven and a half cents per pound in market. The cows have had good pasturing, and been driven one mile to pasture each day, and have had no extra feed. Two of the cows calved in February, and four in March. I have raised five of the calves.

BARRE, 1854.

Statement of William Eames.

The cow I offer for premium is five years old, and is one-half Devon and one-half Durham, raised by myself. She calved on the 10th of May. Being in want of milk, I sold the calf at a week old; it was an ordinary bull calf, got by accident. I dried her off the 1st of March, and she is expected to calve again the middle of April. She has run in a good pasture with three other cows, and had no other feed till August 15, when I fed her freely on corn fodder. The first ten days in June she gave three hundred and twenty-seven pounds of milk, which produced fifteen and a half pounds of butter. The first ten days in September she gave two hundred and fifty-eight pounds of milk, which produced twelve and a quarter pounds of butter.

My dairy came in late, as follows: First cow, May 10; second, June 21; and two three-year-old heifers, the 3d and 5th of July. Their calves were all males, which I sold at three days old. From June 1 to July 10, from one cow were made forty-one pounds of butter. From July 10 to September 12, from four cows were made two hundred and thirty-one pounds, making two hundred and seventy-two pounds of butter. I have kept one sow and seven pigs.

WORCESTER, 1854.

Statement of Amos F. Knight.

I hereby certify that during the present season I have kept a dairy of ten cows. The time of their last and next calving was and will be as follows:—

	Time of last calving.	Time of next calving.
One cow, . . .	Feb'y 15, 1854.	Feb'y 19, 1855.
do. . . .	March 3, “	March 14, “
do. . . .	“ 4, “	“ 3, “
do. . . .	“ 6, “	Feb'y 19, “
do. . . .	April 25, “	March 19, “
do. . . .	May 6, “	“ 7, “
do. . . .	June 8, “	May 2, “
One two-year-old heifer,	April 24, “	April 13, “
do. . . .	June 14, “	May 24, “
One three-y'r-old in June,	September, 1853,	Feb'y 11, “

The committee will perceive that one cow and one heifer did not calve until after I commenced trying them, and the three-year-old heifer was only a farrow one. The keeping has been common pasture, with the addition since the 8th of August of corn fodder once a day, given at night. For the past three weeks it has been fed to them both morning and night.

Quantity of butter made from May 22 to September 22:—

944½ pounds, sold at 27 cents per pound, . .	$255 01
One hundred pounds four-meal cheese made, .	8 00

We used two quarts of milk per day in the family.

I would say that the calves dropped on the 25th of April, 6th of May, 8th and 14th of June, I raised, giving them new milk for the first ten days; after that the milk stood from twelve to twenty-four hours.

West Boylston, September 26, 1854.

Statement of Nathan B. Reed.

My dairy is composed of six cows, aged, respectively, eleven, ten, seven, six, four, and three years. They are the Ayrshire and Holderness breeds, and in part "natives," raised by myself. They dropped the last calf April 19. The cows were dried in January, and will calve in May. They were turned to pasture the first of May, and had a small quantity of corn fodder in addition to pasture feed, and have been fed once a day since the first of August. The cow gave during the first ten days in June three hundred and thirty and a half pounds of milk, and in the first ten days of September one hundred and ninety-three pounds. Each cow made during the first ten days of June eighteen and a half pounds of butter, and during the ten days in September thirteen and a half pounds. I have sold five hundred and thirty-nine quarts of milk, and used what we needed in our family of six persons. The whole amount of butter made from the time of turning to pasture till September 12 was two hundred and seventy pounds; and of cheese we made one hundred and fifty-six pounds of new milk, and one hundred and twelve pounds of four-meal. My cows were driven half a mile to pasture. I raised all my calves, and have kept six swine.

Statement of Joseph P. Reed.

My cow is six years old, half Ayrshire and half Holderness breed, and was raised by myself. On the 26th of April she dropped a good heifer calf, which I am now raising. The cow was dried in February, and is expected to calve in March. She was turned out to pasture on the 1st of May, was fed with corn fodder, and since the 20th of August has been fed with other food once a day. During the first ten days in June she yielded three hundred and twenty-two and a half pounds of milk, which made seventeen and a quarter pounds of butter; and in the first ten days of September she gave one hundred and eighty-two and three-quarters pounds of milk, from which were made twelve and three-quarters pounds of butter. She has been kept with six other cows, and driven half a mile to pasture. The milk has not been kept separate except during the times specified.

PRINCETON, 1854.

WORCESTER.

Report of the Committee on Products of the Dairy.

Upon the schedule presented by the secretary are the names of five competitors, three only of whom have filed in specifications agreeably to the rules of the society—namely, Amos F. Knight, West Boylston; William S. Lincoln, Worcester; and Henry Boyles, Princeton.

A brief synopsis of the statements filed by those to whom premiums were awarded will be given.

From the statement of Mr. Lincoln, it appears that his dairy consists of thirteen cows, twelve of which are kept for dairy purposes, and one for family use; that for trial these cows have been divided into two lots of six each; that in the first lot were one full-blood Ayrshire and one half-blood, one Devon, one thorough-bred Ayrshire, and two commonly called "natives."

From the 22d of May to the 22d of September, a period of four months, the product of butter from these six cows amounted to seven hundred and eighty-two and one-half pounds, which is an average to each cow of one hundred and thirty and one-half pounds in one hundred and twenty-three days, being equivalent to one pound and one ounce to each cow per day during the entire period of four months. In the market, this butter, at twenty-seven cents per pound, would amount to two hundred and eleven dollars and twenty-eight cents; averaging thirty-five dollars and twenty-one cents to each cow as the product of four months. This must be regarded as a very extraordinary result, especially when it is remembered that, during a large portion of the time, a severe drought prevailed, cutting off the feed in the very season that is usually the most favorable for the product.

Upon this statement the committee did not hesitate to award to William S. Lincoln, Esq., the first premium of twenty-five dollars.

For the premium of ten dollars, to be awarded for the best product in butter or cheese from one cow, there was only one competitor—Amos F. Knight, of West Boylston. But, from the following statement filed by him, your committee believe the society will agree with them that Mr. Knight is fairly entitled to the prize.

Mr. Knight, in his statement, says that his cow is nine years old, one-half Ayrshire and one-half "native;" has had the same keeping with the rest of the herd, in common pasture, with the addition since the 8th of August of corn fodder once, and for the last three weeks twice a day; that in four months, commencing May 22, she has produced one hundred and fifty-six and three-fourths pounds of butter, a specimen of which was exhibited and pronounced good. This product averages one pound and four ounces per day during the whole period of four months. During the first four weeks she produced fifty and one-half pounds, averaging one pound and thirteen ounces per day. At twenty-seven cents per pound, the product of this cow amounted in four weeks to thirteen dollars and sixty-four cents.

From these data the committee agreed unanimously to award to Amos F. Knight, of West Boylston, the second premium of ten dollars.

To the intelligent farmers of Worcester County, such facts as these here recorded need no comment. They speak louder than any words of labored argument possibly can of the importance of keeping the best dairy stock that can be obtained. The product of the cow above referred to, at fourteen dollars nearly, would, in four months, pay the ordinary price of a cow; while the price of keeping her was very little, if any, greater than the rest of the herd.

A. H. Waters, *Chairman.*

Statement of William S. Lincoln.

My dairy consists of thirteen cows, twelve of which are kept for dairy purposes, and one for the use of my family.

Since the 1st of August, the cow reserved for the family giving an insufficient quantity of milk, one milking of one of the twelve cows, daily, has been taken from the dairy for family use.

I have one full-blood Ayrshire, one full-blood Devon, two thorough-bred and six grade Ayrshires, and three called "natives."

Of these I have raised five, the rest having been purchased by me at different times.

One is two years old, and one three, each with her first calf.

From the 1st of January to the 24th of April, inclusive, I had made four hundred and twenty-two pounds and eight ounces of butter.

For the purpose of another trial, I divided my dairy into two lots, of five cows, and six cows and heifers. For the last five months each cow has been milked separately, and the cream of each lot of cows churned by itself. The product was eight hundred and fifty-four pounds and eight and one-half ounces of butter.*

The food of these cows was pasture till the 1st of August. At that time for about two weeks they had corn fodder in the barn at the times of milking. Subsequently, the corn fodder having been all fed out, they have picked all they got from the pastures. Early in April I was incapacitated from milking, and since then have had eight different milkers. My stock has suffered severely from this fact, and the yield of milk was seriously affected by it. As an instance, the first week after I left off milking, my yield of butter was some eight pounds less than the preceding one, although another cow had been added to the dairy.

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* A detailed statement of the product of this dairy will be found on a subsequent page.

If I have made no mistake, these cows have been milked for an average period of four months and twenty-one days, and for that period averaging a little more than a pound of butter daily for each.

My butter is worked twice thoroughly. In the manufacture of it, a "butter worker," or "butter table," is used, by which every particle of buttermilk is removed. The sample on exhibition is made as ordinarily, no unusual pains having been taken with it.

WORCESTER, September 25, 1854.

Statement of Henry Boyles.

I hereby certify that I have made from my dairy, from the 1st of May to the 20th of September, ten hundred and eighty-four pounds of butter, and sold two hundred and thirty-nine quarts of milk, and used in my family five quarts per day, and that my dairy has consisted of six cows and four heifers, as follows:—

No. 1 cow calved March 28; calf taken off May 9; farrow, dried September 1.

No. 2 cow calved April 1; calf taken off May 9; will calve June 1.

No. 3 cow calved April 4; calf taken off May 9; farrow.

No. 4 cow calved March 17; calf taken off April 23; farrow.

No. 5 cow calved March 15; calf taken off April 23; killed August 1.

No. 6 cow calved March 7; calf taken off April 8; will calve April 1.

No 7, three-year-old heifer calved March 3; calf taken off April 8; will calve May 10.

No. 8 three-year-old heifer calved March 6; calf taken off April 29; will calve May 15.

No. 9 two-year-old heifer calved May 28; calf taken off July 2; will calve April 20.

No. 10 two-year-old heifer calved June 12; calf taken off August 1; will calve May 1.

No. 1 cow,	milked from	May 9	to September 1.
" 2 cow,	" "	May 9	to September 20.
" 3 cow,	" "	May 9	to September 20.
" 4 cow,	" "	April 23	to September 20.
" 5 cow,	" "	April 23	to August 1.
" 6 cow,	" "	April 8	to September 20.
" 7 three years old,	" "	May 8	to September 20.
" 8 three years old,	" "	May 20	to September 20.
" 9 two years old,	" "	July 2	to September 20.
" 10 two years old,	" "	August 1	to September 20.

Five swine were kept through the summer almost exclusively on milk.

The above dairy was kept on hay through the winter, with the addition of two quarts of cob meal daily to the cows and three year olds, from the time of calving to the middle of May; since then they have had nothing but common pasture feed, with the addition of a few cornstalks daily since August 19; fed in the morning.

PRINCETON, September 26, 1854.

Statement of Amos F. Knight.

The cow which I present for premium is one of a herd of ten kept by myself the present season. Age, nine years. Breed, one-half Ayrshire and one-half "native." Calved April 25; time of next calving, March 19. Keeping, the same as the rest of the herd—common pasture, with the addition, since the 8th of August, of corn fodder once, and for the last three weeks twice a day.

Quantity of butter made for four months, commencing the 22d of May:—

	lbs.	oz.		lbs.	oz.
May 22 to May 29,	12	8	July 21 to July 28,	8	0
May 29 to June 5,	13	0	July 28 to Aug. 4,	7	0
June 5 to June 12,	12	8	Aug. 4 to Aug. 11,	6	12
June 12 to June 19,	12	8	Aug. 11 to Aug. 18,	6	8
June 19 to June 24,	9	0	Aug. 18 to Aug. 25,	6	8
June 24 to July 1,	11	10	Aug. 25 to Sept. 1,	5	4
July 1 to July 7,	11	6	Sept. 1 to Sept. 8,	5	4
July 7 to July 14,	8	12	Sept. 8 to Sept. 15,	5	8
July 14 to July 21,	8	0	Sept. 15 to Sept. 22,	6	8
			Whole amount, . . .	156	12

A sample of this butter is exhibited.

West Boylston, September 26, 1854.

Report of the Committee appointed to award the State Premiums on Dairies.

The trustees of the Massachusetts Society for the Promotion of Agriculture, in a spirit of large and enlightened liberality, having placed at the disposal of the Worcester Agricultural Society generous premiums for the encouragement of the dairy, Levi Lincoln, of Worcester, John Brooks, of Princeton, Thomas W. Ward, of Shrewsbury, Charles Demond, of Westboro', and David Lee, of Barre, were appointed by the trustees of the latter society to receive and examine the claims of the competitors, and to determine the award of these premiums, and, having given to the discharge of the duty assigned them all the attention and carefulness in their power, respectfully submit their report.

"The dairy," in its broadest signification, is a term of large comprehensiveness. It embraces the animals, their management and their treatment; their product in calves and in milk; the care, use, and disposition of the milk; the manufacture of butter and cheese; the dairy house and its utensils; the keeping of swine; indeed, in one word, the dairy comprises the cows and their product and profits, however obtained and in whatever they may consist.

Rural encyclopedists have divided the dairy into three classes—the milk dairy, the cheese dairy, and the butter dairy. All these were put within the scope of our commission. The trustees of the State Society made no limitations and prescribed no regulations for our inquiry. Their proposals were for the three best dairies, each "of not less than six cows in number, which shall have been owned by the exhibiters respectively, and kept within the county, not less than five months previous to the cattle show." In the construction given to these proposals by the trustees of the county society, which are made the warrant and rule for the judgment of the committee, it is assumed that the purpose obviously was, "to encourage the better attention to the business of the dairy, and, in return for the premiums, to secure the most varied and largest amount of information in its successful and faithful management;" and it is further declared, that "this object is best to be promoted by leaving each competitor to pursue his own course of management at the peril that some other mode may be more productive under the conduct of some other competitor. Should special and particular regulations, to be observed by all alike, be prescribed, a compliance with these would indeed show who was most successful in conforming to them, but would furnish little or no information of better success under a different course of practice. It was, therefore, only required, as a general rule, but to a compliance with which competitors were to be rigidly held, that "they exhibit their dairy of six cows, for which they claim the premium, on the society's grounds at the cattle show, and accompany the entry, made on the day before the exhibition, by a statement in writing, under oath, of their management on the farm, and their product during the season of trial, with all such particulars as will enable the committee of judges to decide satisfactorily, not only upon the relative claims of the several competitors for the premiums, but upon the management and absolute product in weight and profits of each dairy, respectively, whether in butter, cheese, or milk, through the assigned period of trial, to wit, for five months before the show.

Accordingly, under the above-recited rule the committee have directed their examinations and exercised their judgment in deciding upon the claims of the only competitors for the premiums. It was equally matter of regret as of surprise to the committee that but two persons had made their entries within the time prescribed by the trustees, and but one other person, although not conforming to the required time of notice, had sought to be admitted to the competition. The sums offered as inducements to the trial seemed to be most liberal, and, regarded merely in the light of promised rewards for attention and labor, were certainly sufficiently remunerative. It was hoped, too, that the known good management and high character of the dairies of the county of Worcester would have rendered the required account of their treatment and product both easy and pleasant to their owners, and the honest and laudable pride of the farmer be gratified in his opportunity of comparison with like interests in other sections of the Commonwealth. The competitor was constrained by no precise exaction of service, nor trammelled by conformity to prescribed rules of conduct, but the whole business of the dairy was submitted to his own judgment; and all that was asked was a statement of what he had done, and with what success it had been attended. The occasion may never again be so favorably presented of justifying the reputation of our dairy farmers, and advancing that interest in rural economy which unites with the improvement of the farm the surest and richest compensation for agricultural labor.

The two entries to be considered by the committee, in reference to the premiums, were made by William Robinson, Jr., of Barre, and William S. Lincoln, of Worcester. Each of these entries was in season, and accompanied by minute statements, in substantial conformity to the requirement of the trustees. Each dairy consisted "of not less than six cows in number, and had been owned by the exhibiters respectively, and been kept within the county, not less than five months previous to the cattle show," in accordance with the proposals of the premiums.

Mr. Robinson's whole dairy consists of sixteen cows, from which, at the commencement of the season, he selected six for the trial. His farm contains about two hundred acres, and is principally cultivated for the uses of the dairy, the product of which is its greatest profit. The milk is almost exclusively manufactured into cheese; and from the reputation for excellence which this has acquired, he is able to obtain for it the highest prices of the market. It appears by his statement that his cows were a cross of the improved short-horns, being, in his own language, "grade Durhams, one-half and three-fourths blood," and were from six to nine years old. They all calved between the 28th of March and the 19th of April, so as to bring them in milking nearly together, and give the full benefit of the whole season for the product. Mr. Robinson states that these cows "were kept with his dairy of sixteen cows in a good pasture of natural pasture land, on which there has formerly been plaster of Paris, or gypsum, applied, but not for two years past; that they have each had two quarts of Indian meal per day for the past five months, and had green corn fodder given them, for twenty-three days, the latter part of August and first of September." He also states that "they had two quarts of provender per day during the preceding winter." They were milked twice a day, during the season of trial, regularly between five and six o'clock, morning and evening, and, with the exception of two instances, always by the same milker.

The trial commenced on the 24th of April; and Mr. Robinson gives the daily aggregate weight of milk of these six cows, weighed morning and evening, during the entire period of the five months. From these daily accounts it appears that the greatest amount in any one day was on the 30th of May, two hundred and seventy-one pounds, and the smallest amount on the 15th of August, one hundred and sixty pounds. The cows were uniformly driven back to the pasture after being milked; and it is quite noticeable how nearly equal in quantity were the morning and evening milkings, very clearly showing the benefit of the night pasturage over the too general practice of yarding the cattle at the barn. It cannot be otherwise, that, in the long and hot days of the season, cows early relieved of the milk in their distended udders, and returned to feed on the fresh herbage of the field in the cool shade of evening, and afterwards left quietly to repose on the clean greensward, will yield more to the pail than when confined over night in close yards, often made foul and uncomfortable to the animals, for the sole purpose of adding to the manure heap. The first requisite to a good dairy is cleanliness; and if a farmer will make a stercorary of his barn yard for the improvement of his crops, he should bear in mind that neither the dung hill nor the compost pit is a fit place for the stock which furnishes direct supplies to the churn and the cheese press.

The whole product of Mr. Robinson's dairy of six cows, for the period of five months, is given by him at two thousand nine hundred and seventy-four pounds of cheese. Of this quantity

he states that one thousand six hundred and twenty-three pounds were sold at eleven cents, producing	$177 55
And one thousand three hundred and fifty-one pounds on hand, (after allowing for shrinkage,) to be delivered at the depot on the 1st of November, at twelve and one-half cents, is	162 18
In addition to which, he made seven pounds of butter on the last day of trial,	1 75
Making an aggregate yield of the value of	$342 48

Mr. Lincoln's dairy, offered in competition with that of Mr. Robinson, likewise consisted of six cows, selected from his stock of twelve cows and heifers kept together during the season. This dairy is exclusively for the making of butter for the supply of private customers, to whom it is previously engaged. His farm is a large one, of about two hundred acres; but a considerable part of it is in wood, and a still greater proportion in an interval mowing lot, cultivated by irrigation from the waters of the Blackstone. The pasturage is upon high and light land, productive early in the season, but soon affected by dry weather. His cows are of different races, one being a full-blood Ayrshire, two half Ayrshire, one believed to be a cross with the Durham, one a thorough-bred Devon, and one "native," and their ages, respectively, from five to ten years. They calved at different dates from January 28 to May 20—thus being in milk for very unequal periods of time during the season. Their keeping, as stated by Mr. Lincoln, was on pasturage alone, with the exception of corn fodder for about three weeks in

August. The feed, part of the time, was "unprecedently short; and the season, as a whole, has been a bad one, below the average, for making butter." Mr. Lincoln states that, owing to an accident and peculiar circumstances, he was necessitated to change his milkers frequently, and that the yield, from this cause, was greatly diminished. His cows were milked regularly at six o'clock, morning and evening, and after being milked, as with Mr. Robinson, were returned to the pasture.

Mr. Lincoln furnishes a very minute and instructive account of the treatment of his cows in the stable, of the order of milking, the disposition of the milk, the care and management of the dairy room and its utensils, and of the process of manufacturing the butter, by the thoroughness of which he has at all times been able to command the readiest sale and the highest price for the commodity. He gives as the actual product of his six cows for the five months, in butter, accurately ascertained by weight at each churning, an aggregate of eight hundred and fifty-four pounds and eight and one-half ounces. This was all sold to customers, and produced, at thirty-three and one-third cents per pound, two hundred and eighty-four dollars and eighty-three cents.

It appears, however, from Mr. Lincoln's statement, that the trial commenced on the 24th of April with but three of six cows in milk, and that, owing to the irregular times of their coming in, the dates of which are particularly noted, there was consequently within the five months an average period of milking, for six cows, of four months and twenty-one days only, and that, had they all been in milk the full period of five months, at the rate of yield for the time of actual milking, they would have given nine hundred and twenty pounds and four and one-half ounces, producing three hundred and six dollars and seventy-five cents. The greatest amount of butter made in one week was fifty-seven pounds and eight ounces, or an average of nine pounds and nine and one-third ounces to each cow, and this upon pasture feed alone. A sample of Mr. Lincoln's butter was exhibited to the committee, and fully justified the reputation of his dairy. He also furnished a statement of profits from swine, kept exclusively upon the wash of the dairy and house, with the addition only of a small quantity of refuse apples, since August. Mr. Robinson gives no account of his swine. Each gentleman raised an equal number of calves from their cows.*

Upon carefully comparing the claims of Mr. Robinson and Mr. Lincoln, the committee find that Mr. Robinson's dairy gave a product, for the entire period of five months, in milk manufactured into cheese, inclusive of a few pounds of butter from the milk of one day, of three hundred and forty-two dollars and forty-eight cents. Mr. Lincoln's cows, in four months and twenty-one days, in milk manufactured into butter, gave a product of two hundred and eighty-four dollars and eighty-three cents, which for the remaining ten days, at the same average rate, would have been increased to three hundred and six dollars and seventy-five cents.

The cows of each had about the same amount of green corn fodder fed to them; but Mr. Robinson states that his cows had each two quarts of Indian meal per day through the season of trial, having also been fed with provender the preceding winter. The cows of Mr. Lincoln, by his account, had no meal or provender at any time.

In determining the profits of these respective dairies, the committee are of opinion, that, admitting the pasturage and corn fodder to have been equal, the extra expense of Indian meal fed to the cows of Mr. Robinson should be deducted from his account. Two quarts per day, for five months, would give fifty-seven bushels and nine quarts, which, at the price the past season, would cost fifty-seven dollars and thirty-one cents, and, deducted from

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* In reference to the keeping of swine, as an accompaniment of the dairy, no reference is made in this report, inasmuch as, from the omission of Mr. Robinson to include such keeping in his statement, the committee had not the means of comparison between the competitors. Mr. Lincoln states that he derived from this source considerable profit. The committee cannot doubt that, by the whey of a cheese dairy, or the buttermilk of a butter dairy, great advantages may result in the raising of swine. There is also much value in the skimmed milk of a butter dairy, which may be applied to various domestic uses, or, near populous places, be readily and fairly sold at its worth, and add sensibly to the net income of the concern. The relative value of this refuse of the milk pan and the cheese press has never, to the knowledge of the committee, been ascertained by actual trial; but in any future experiments, a fact so important in the economy of the farm should not be overlooked.

	$342 48
	57 31
Leaves to Mr. Robinson	$285 17
Against Mr. Lincoln's account of	306 75

Or two hundred and eighty-four dollars and eighty-three cents actual proceeds for four months and twenty-one days only. The pasturage of Mr. Robinson is represented by him to have been good, while Mr. Lincoln complains that his was severely pinched with the drought of the season. The feeding of meal to Mr. Robinson's cows may have improved the condition of the animals, but does not appear to have added, in any degree corresponding with the cost, to the quantity or quality of the milk; and with good pasturage, the committee cannot recommend the practice.

The cows of both dairies were exhibited at the cattle show on the 27th of September, in compliance with the proposals, and were examined by the committee. They were, without exception, fine animals, having all the points of good milkers. Those of Mr. Robinson were obviously the largest and heaviest, as might be expected from their Durham blood, without regard to any difference in their feeding.

In the sale of their commodities both gentlemen obtained unusual high prices; but in the ratio of three pounds of cheese to one pound of butter, which has long been considered as the just equivalent of the one to the other, Mr. Robinson seems to have had the advantage in the market, inasmuch as his three pounds of cheese gave an average price of thirty-four and one-half cents, while Mr. Lincoln's one pound of butter obtained but thirty-three and one-third cents. It would be a most desirable and curious experiment to ascertain the result of the reciprocal conversion of the milk of each of these daries to the uses of the other, as it would tend to settle, more satisfactorily than in any other manner, the much-vexed question, whether the same animals are equally profitable for both productions.

The committee, taking into consideration the unequal period of the calving of Mr. Lincoln's cows previous to and during the time of trial, their unquestioned inferior pasturage, and the difference in expense of keeping in the meal fed by Mr. Robinson, in connection with the absolute product and profit of each dairy, are unanimously of opinion that William S. Lincoln, of Worcester, is entitled to the first premium offered by the trustees of the Massachusetts Society for the Promotion of Agriculture, "For the best dairy of cows, not less than six in number, which shall have been owned by the exhibiter, and kept within the county, not less than five months previous to the cattle show," seventy-five dollars;

And that William Robinson, Jr., of Barre, is entitled to the premium "for the second best," fifty dollars; and the committee adjudge the premiums accordingly.

The committee, in justice to these competitors, cannot forbear to add, that, in the careful attention manifested by them in the selection of their cows for the products of their dairies, respectively, in the order, system, and good management of these daries, the method and precision of their accounts, and the value of the facts and observations conveyed in their several communications, they have fully earned the pecuniary reward of their experiments, and especially deserve the thanks of the agriculturists of the State. These gentlemen are among the best farmers of the county, and their farms, within the personal knowledge of some of the members of the committee, are conducted with skill, orderly arrangement, and good success. They are both in the prime and vigor of life, and afford examples of personal industry, assiduity, and intelligence, in the direction and application of labor to the cultivation of the earth, well worthy of notice and imitation by the young yeomanry of the country.

In addition to the dairies before mentioned, for which premiums are awarded, Mr. Lincoln gives a detailed account of the separate product of six other cows and heifers of his stock the past season. The information will be useful as the result of further careful attention to the properties and profits of this description of animals; but the proceeds being less than from his older cows, it is not necessary to enter into the particulars of the comparison.

Mr. William W. Watson, of Princeton, on the day of the show, offered to the committee an informal and imperfect account of his dairy of six cows the past season; but as he had not given seasonable notice of his intention to become a competitor in conformity with the requirement, he had been excluded by a special vote of the trustees. The committee, however, that no injustice might be done to his merits, took the pains to examine his statement, and regretted to find that, had his claims been received in time, he had not entitled himself to be regarded as a competitor. Indeed, it was manifestly apparent, from the statement itself, that his attention had been directed to the proposals of the County Society for "milch cows." He gave the product of butter for ten days only in June, and ten days in September, together with a quantity of skim-milk cheese made and sold during the season. There was no such account furnished, according to the rule, as would enable the committee of judges to decide satisfactorily, not only upon the relative claims of the competitors for the premiums, but upon the management, and absolute product in weight, and the profits of each dairy; nor did he furnish any information of value for communication to others. The limitation of the time of notice was therefore of no prejudice to his chance of success as a competitor, having brought himself within none of the requirements or conditions for obtaining a premium.

There being no competitor for the third premium, the committee make no recommendation for its bestowment.

The committee are fully and gratefully sensible to the obligations of the agricultural community for that beneficent and enlightened liberality which prompted the trustees of the State Society to make this attempt to improve the dairy husbandry of Massachusetts. However less multiplied or satisfactory have been the experiments than might have been anticipated from the munificence of the proffered inducements, yet it is hoped that such as have been made the subject of this report will not be without their advantages. They assuredly cannot fail to convey to the mind of the practical farmer lessons of instruction in the care and attention to dairies, and great encouragement to this branch of rural economy in its productiveness. Especially, in the present universal demand for good butter and cheese, and the high prices which they command, for family use, the prudent and thrifty housewives of the yeomanry of New England may derive a profit from the labors of the household, in their manufacture, which no other occupation will afford. There is health and satisfaction, too, in the business of the dairy. It necessarily exacts exercise and industry, and induces to habits of order, neatness, and regularity in the family. There is no domestic service more remunerative for the time it occupies, and none less objectionable in the character of the employment. The committee cannot feel that they discharge their duty without adding an urgent recommendation that these trials be encouraged, either under the good auspices of the state or of the county societies.

The chemical constitution of milk shows the same properties in very different proportions in different milking animals. The *butteraceous* principle prevails largely in the yield of some cows, while the *caseous* and *serous* predominate in others. It is obvious, then, that the particular purpose of the dairy, whether for the making of butter or cheese, should be primarily regarded in the selection of the stock best adapted to the object to be pursued. But has this consideration been sufficiently attended to, or indeed at all understood, by our professed dairymen? It is generally known that the milk of some cows will give little or no butter; but is it as well known that the same milk will produce plentifully the curd of cheese? And what farmer knows how to adapt his dairy to its appropriate productiveness, or can answer the question, from any experiments made by himself or others, of which of the races, Durham, Devon, Ayrshire, or Alderney, come the best dairy stock, or by what distinctive marks to select the best individuals from either race? On these most interesting subjects there is a lamentable want of practical information; and it is surely through the encouragement and intelligent direction of appropriate associated public bodies that such knowledge can best be obtained. The committee are well assured that, with the interest excited by these premiums, and the publication of the reports, and by an earlier and more extended previous notice another year, with more precise regulations and requirements as to the time and manner of conduct and trial, and detail of results, a much greater and closer competition would be produced, and that in no way would the husbandry of the country, in one of its leading and highest interests, be more effectually promoted.

The particular written statements of the competitors are herewith also submitted.

For the committee, and by their order,

LEVI LINCOLN, *Chairman.*

At a special meeting of the trustees of the Worcester Agricultural Society, November 16, 1854:—

The report of the committee on premiums for dairies, offered by the trustees of the Massachusetts Society for the Promotion of Agriculture, was presented by the chairman; and having been read and considered, it was accepted, and thereupon ordered, That the secretary certify the awards of premiums made by the committee to the secretary of the Massachusetts Society; and that he also transmit therewith a printed copy of the report, with the statement of the competitors accompanying the same, to be laid before the trustees of said society.

Statement of William S. Lincoln.

To the Committee of the Worcester Agricultural Society, appointed to award the premiums for dairies offered by the Massachusetts Society for Promoting Agriculture:—

As a competitor for the premiums at your disposal, I offer for your examination twelve animals, constituting my dairy. One other cow has been kept with these during the summer; but, as she has been kept exclusively for the use of my family, she is not exhibited. Having determined, early in the season, to become a competitor for our own society's premiums for dairies, it was necessary to divide my stock; and the milk of each, as well as the product of such milk, has been kept separate during the assigned period of five months.

Informed by the circular issued by authority of the Board of Trustees, that the purpose was to "encourage the better attention to the business of the dairy, and in return for its premiums to secure the largest and most varied amount of information in its successful and faithful management,"—which purpose was best to be promoted by leaving each competitor to pursue his own course of management, at the peril that some other mode might "prove more productive under the conduct of some other competitor,"—I deemed it best, and likely to be more satisfactory, to keep along in my regular system, deviating in no degree from that course which is practised by me every day of every season.

Thus the committee will perceive that I render no account of the quantity of milk, either in weight or measure, yielded by any one or more of my cows for any one or more days; for, though a statement that a cow has given a specified number of quarts or pounds of milk for a given number of days might gratify the curious in statistics, the experience of no inconsiderable number of years has convinced me that this was of no value in testing the worth of an animal for butter.

The return, then, which I submit will be merely a statement of the mode pursued by me in the management and feeding of my stock, of the care of the milk, with the dairy utensils, and the amount of butter produced during the required period of trial.

The trial began on the 25th of April last, before turning to pasture.

Management of Stock while stalled.—In the management of my stock the utmost gentleness is observed, and exact regularity in the hours of feeding while confined to the stable, and of milking throughout the year.

The stock is fed regularly three times a day.

In the morning, as soon as the milking is over, each cow (having been previously fed and her bag cleaned by washing, if necessary) is thoroughly cleaned and groomed, if the expression may be used, with a curry-comb, from head to foot, and, when cleaned, turned out to drink. The stable is now cleaned out, the mangers swept, and the floors sprinkled with plaster; and as the cows return, which they do as soon as inclined, they are tied up and left undisturbed until the next hour of feeding, which is at noon.

The cattle at this time are again turned out to drink, and, after being tied up on their return again, fed. Of course the stable is at this time again thoroughly cleaned. And so again at night the same course is pursued. At this time a good bedding is spread for each cow, and, after all are in, they are fed.

At six o'clock the milking commences, and at its termination, after removing from the floor whatever manure may have been dropped, the stable is closed for the night. If carrots are fed, which is the only root allowed to my cows in milk, they are given at the time of the evening milking.

Whatever material is taken for bedding (such as corn stalks, husks, &c.) is passed through a cutting machine, and composes the noon feed, such portions as are not consumed by the cows being used for bedding. The additional labor of cutting up is amply compensated by the reduced amount of labor in working (loading) and ploughing under the manure.

While I consider it highly desirable that the cows, during the period they are stabled, should be kept warm and dry, I regard it as indispensable that they should be perfectly clean; and although the stock is stabled the whole time, care is taken that there is a sufficient degree of ventilation.

Milking.—As before observed, this takes place throughout the year at six in the morning and six in the evening.

As a general rule, each cow is milked separately, her milk strained and set separately. With heifers this is invariably done, as I believe there is no other reliable mode of determining the value of an animal for butter; and in this way, and a separate churning also, is it determined whether to retain in my dairy or sell to some milkman such heifers as I may raise.

The same regularity is observed in the order in which the cows are milked as in the hours of milking.

The milk, as soon as drawn, is taken to be strained and carried into the milk room. Here it stands from twenty-four to thirty-six hours, (in some months of the year forty-eight hours,) at which time it is removed to an adjoining room to be skimmed. In this way the room is free from those odors which always follow the spattering of milk or cream upon the floor or shelves of the dairy. We mean to skim *sweet* milk.

The milk room is upon the second floor of the house, and running its whole width, ventilated by windows at the north and south, and in the winter months warmed to a proper degree by a stove.

Tin pans are used in which to keep the milk, filled generally to a depth of two or two and one-half inches.

The cream, as it is skimmed, is poured into stone pots, which in warm weather are kept in a refrigerator, and during the winter stands in the milk room.

The times of churning depend upon the quantity of cream. During this summer there have been four churnings a week.

The time usually occupied in churning is from fifty minutes upwards. This is deemed a matter of importance. We consider it much better to bring the cream to the degree of temperature necessary to the formation of butter by a steady, moderate agitation, than to use artificial heat to take it to that point before commencing to churn. By such moderate, long-continued agitations, we think the butter has a firmer, more waxy consistence than it can have by more rapid churning. The churn used is "Galt's." Numerous trials have been made with many of the other kinds of churn in comparison with this, and the result has been uniformly favorable to this pattern.

When the butter has *come* the buttermilk is drawn off, and the butter, after being thoroughly worked, is salted with from one-half to three-fourths ounces of salt to the pound. It is now set away for twenty-four hours, when it is again worked over thoroughly and made into pound lumps with wooden "spatters." After standing another twenty-four hours it is sent into market.

In "working" butter we use a table over which a fluted roller is made to pass, rolling out butter into a thin sheet, and completely and entirely depriving it of buttermilk.

From many years' experience, the observation is warranted that by no other process of manufacture can the buttermilk be so completely extracted.

I am aware of the truth of the objection made, that the shrinkage occasioned by its use is too great; yet there is in fact a difference in the worth of the butter made upon it, over that manufactured in the ordinary way, quite equal to the loss in weight occasioned by it.

As has been stated, my stock was divided at the beginning of the trial into two lots of six each. The account of the product of butter is given according to this arrangement.

The entries for the premiums at your disposal, as made by me on the 23d of April last, were one dairy of cows and heifers six in number, and a dairy of eleven in number.

Such a division of my stock was not deemed improper in view of their time of calving and their age.

The dairy of cows consists of

Flora McDonald, a full-blood Ayrshire, from the stock of Mr. Randall, of New Bedford, six years old.
Wilcox, half Ayrshire, by McGregor, five years old.
Shrewsbury, called "native," believed to be Durham, eleven years old.
Cherry, Devon, six years old.
Lexington, Ayrshire, bred by Mr. Phinney, of Lexington, nine years old.
Springfield, "native," from Vermont, ten years old.

Flora McDonald	calved	May 20,	and was	served	July 29;
Wilcox	"	April 17,	"	"	June 5;
Shrewsbury	"	February 26,	"	"	July 2;
Cherry	"	May 2,	"	"	June 30;
Lexington	"	January 28,	"	"	July 18;
Springfield	"	May 2,	"	"	June 10;

It will be seen that the trial commenced with three of the six cows giving milk. The periods of churning and the quantity of butter made at each time are stated below:—

Churned	May	1,	19	pounds	2	ounces,	
"	"	8,	20	"	3	"	
"	"	15,	32	"	5	"	
"	"	22,	39	"	13	"	
"	"	29,	44	"	9	"	——156 00

Churned	June	1,	25	pounds	7	ounces.		
"	"	8,	56	"	0	"		
"	"	12,	32	"	14½	"		
"	"	15,	24	"	9½	"		
"	"	19,	29	"	9	"		
"	"	22,	21	"	13	"		
"	"	26,	28	"	7	"		
"	"	29,	21	"	8	"	——240	4
"	July	3,	27	"	15	"		
"	"	7,	18	"	11	"		
"	"	10,	24	"	2	"		
"	"	13,	16	"	8	"		
"	"	17,	22	"	7	"		
"	"	20,	15	"	8	"		
"	"	24,	18	"	5	"		
"	"	27,	14	"	7	"		
"	"	31,	18	"	14½	"	——176	13½
"	Aug.	3,	13	"	6	"		
"	"	7,	17	"	0	"		
"	"	10,	17	"	5	"		
"	"	14,	25	"	8	"		
"	"	17,	18	"	11	"		
"	"	21,	23	"	5	"		
"	"	25,	14	"	9	"		
"	"	28,	17	"	9	"	——147	5
"	Sept.	4,	36	"	7	"		
"	"	11,	34	"	9	"		
"	"	18,	32	"	15	"		
"	"	23,	30	"	3	"	——134	2
							854	8½

It will be seen that three of the cows have been milked five months, two four months and seventeen days, and one four months and two days. In all there has been an average period of milking of four months and twenty-one days, and an average daily amount of little over a pound of butter to each cow for the whole period of entire milking. The greatest amount in any one week was fifty-seven pounds eight ounces, or an average yield of nine pounds nine and one-third ounces per cow for the week. This was upon pasture feed alone.

The lot of young cows and heifers consists of

Lexington, five years old, thorough-bred Ayrshire, bred by Mr. Phinney, of Lexington.
Princess, three years old, with her first calf, a half-blood Ayrshire and half Devon.
Cora, five years old, three-quarters Ayrshire and one-quarter Durham.
Red Bird, four years old, one-half Devon and one-half Ayrshire.
Flirt, five years old, one-half Ayrshire, by McGregor.
Beauty, two years old, three-quarters Ayrshire.

Lexington	calved	February 4,	and was	served	March 15,
Princess	"	March 26,	"	"	June 10,
Cora	"	May 2,	"	"	June 5,
Red Bird	"	June 19,	"	"	August 14,
Flirt	"	June 26,	"	"	July 18,
Beauty	"	August 2,	"	"	September 1.

In this case the trial commenced with but two animals giving milk. The period of churning, and the product of butter of each churning, is given below:—

Churned	May	1,	8	pounds	6	ounces.	
"	"	8,	9	"	4½	"	
"	"	15,	12	"	12	"	
"	"	22,	18	"	13	"	
"	"	29,	21	"	11	"	—— 70 12½
"	June	5,	26	"	13	"	
"	"	12,	19	"	15	"	
"	"	15,	9	"	11	"	
"	"	19,	13	"	1	"	
"	"	22,	12	"	4	"	
"	"	26,	16	"	3	"	
"	"	29,	13	"	12	"	——111 11

Churned	July	3,	21	pounds	12½	ounces.	
"	"	6,	15	"	14	"	
"	"	10,	19	"	7	"	
"	"	13,	14	"	1	"	
"	"	17,	18	"	11	"	
"	"	20,	12	"	12	"	
"	"	24,	16	"	5	"	
"	"	27,	13	"	1	"	
"	"	31,	16	"	13	"	——148 12½
"	Aug.	3,	12	"	8	"	
"	"	7,	16	"	0	"	
"	"	10,	16	"	10	"	
"	"	14,	22	"	3	"	
"	"	17,	16	"	14	"	
"	"	21,	19	"	15	"	
"	"	24,	11	"	7	"	
"	"	28,	15	"	14	"	——131 7
"	Sept.	4,	31	"	5	"	
"	"	11,	27	"	8	"	
"	"	18,	27	"	11	"	
"	"	23,	28	"	7	"	——114 15
							577 12

Of this lot two animals have given milk the whole period, one four months and seventeen days, one three months and two days, one two months and twenty-six days, and one one month and seventeen days, making an average period of three months and twenty and one-third days, and an average daily yield of fourteen and ten-twelfths ounces of butter to each cow for the above period. The greatest amount of butter in any one week of the above period was thirty-seven pounds ten and one-half ounces from five cows, or an average of seven pounds eight ounces to each animal. This was also upon pasture solely.

Should the committee be of opinion that this division of the dairy is not in compliance with the spirit of the offer, the average period of time of milking the cows comprising the whole dairy will be four months and a little more than twelve days, with a total yield for said period of one hundred and nineteen pounds eight and one-third ounces to each cow.

In addition to this product nine calves have been raised, and three sold to be fatted. Five shotes have been sold for forty dollars; two pigs at ten dollars; and there is now on hand five late spring pigs, three old hogs, and four sucking pigs. The swine were kept exclusively upon the wash of the dairy and house till the last of August; since that time a small quantity of refuse apples has been added to their food.

The pasturing was good early in the season, so far as quantity went. But, although its quantity was sufficient, it was of poor quality for the purpose of the dairy.

My pastures are upon the south slope of a hill, early to start, but easily affected by drought.

This year the feed has been unprecedently short, and for weeks my animals might almost be said to suffer. There was no green thing in the pastures, nor would the mowing fields afford a bite.

I had no corn fodder till about the fifth of August, and then so limited a supply that it was consumed in less than three weeks.

The season, as a whole, has been a bad one—below the average for the production of butter.

Additional to this, my own dairy has suffered from a change of milkers. Men to work on a farm have been scarce; of actual *help* there has been none. Early in the spring I was incapacitated from milking, and continued so for months. My cows were badly treated and worse milked. As an instance, the week after I was compelled to give up milking, although one more cow was milked than before, the yield of butter was diminished eight pounds and a fraction.

I ought also to state that from the first of August one milking of one of the cows has been taken from the dairy for family consumption, thus diminishing what would have been the actual yield of butter from the whole dairy. A sample of butter, as ordinarily made, is submitted for the examination of the committee.

Omitting fractions, my dairy of six cows, had they been milked the full period of five months, at the rate of yield for the time of actual milking, would have given nine hundred and twenty pounds four and a half ounces of butter. It will be remembered that this was upon pasture feed alone.

Different families in this city, and at Boston and Dorchester, have been supplied by me the past season; and the average price of the butter has been two shillings per pound, amounting to three hundred and ninety-six dollars and seventy-five cents, or sixty-one dollars and fifty-eight cents per cow for the five months.

Commonwealth of Massachusetts.

Worcester, September 25, 1854.—Then appeared the above-named William S. Lincoln and made oath that the foregoing statement, by him subscribed, is true.

Before me,

John A. Dana, *Justice of the Peace.*

Statement of William Robinson, Jr.

I offer for the State Society's premium six cows, three of which were raised by me; two are seven years old, one six years. The three were raised, one by Elias Ayres, formerly of this town, and now located in Virginia, and is nine years old; one by David Lee, and is six years old; and one by Harrison Bacon, and is eight years old. They are all grade Durhams from one-half to three-quarters, and five of them were sired by bulls brought to this town from Albany by Elias Ayres. There were four of them brought up, when calves, on whey, and I believe all of them, though I am not able to state positively in reference to two of those which I bought. Those I raised had calves when two years old, and the others I do not know about.

These cows have been pastured with my dairy of sixteen cows in a good pasture of natural land, on which there had formerly been plaster of Paris, or gypsum, applied, but not for two years past. They have had two quarts of Indian meal a day during the past five months, and had green corn fodder for twenty-three days the latter part of August and the first part of September. During the winter they were kept on poor fodder, and had two quarts of provender per day till the 1st of March, when they had good hay, as much as they would eat.

The cows calved from the 28th of March to the 19th of April. They were turned out to pasture on the 8th of May, and fed with hay morning and evening till the 15th of May, after which they were driven back to pasture after milking. They were milked twice in twenty-four hours, between four and five o'clock, by one milker, except in two instances. They were all dried in February, and during the time they yielded in milk and cheese as per table below:—

Date.	Milk Weighed.			Date.	Milk Weighed.		
	Morning.	Evening.	Total.		Morning.	Evening.	Total.
April 24,	104¾	105¾	210½	May 22,	119	135¾	254¾
" 25,	106¾	101¾	208½	" 23,	127½	132½	260
" 26,	97¾	103¾	201½	" 24,	125¾	128¾	254½
" 27,	114¾	103¾	218½	" 25,	120¾	127¾	248½
" 28,	107¾	100¾	208½	" 26,	124½	128	252½
" 29,	100¾	93¾	194½	" 27,	12[illegible]	132¼	257
" 30,	103¾	98¾	202½	" 28,	12[illegible]	130¾	255½
May 1,	100¾	93¾	194½	" 29,	123[illegible]	118¾	242½
" 2,	98¾	98¾	197½	" 30,	137¾	133½	271¼
" 3,	106¾	110¾	217½	" 31,	124¾	131¾	256½
" 4,	108¾	104¾	213½	June 1,	127	131¾	258¾
" 5,	104¾	101¾	206½	" 2,	122¼	130¼	252½
" 6,	105¾	97¾	203½	" 3,	126	133¼	259¼
" 7,	100¾	96¾	197½	" 4,	125¾	123	248¾
" 8,	94¾	95¾	190½	" 5,	124¾	137½	262¼
" 9,	91¾	98¾	190½	" 6,	117¼	134	251¼
" 10,	100¾	95¾	196½	" 7,	118	125¾	243¾
" 11,	102¾	101¾	204½	" 8,	128¼	129	257¼
" 12,	101¾	106¾	208½	" 9,	120½	129	249½
" 13,	101¾	107¾	209½	" 10,	117	128¾	245¾
" 14,	111¾	108¾	220½	" 11,	123½	128½	252
" 15,	117¾	119¾	237½	" 12,	122½	132½	255
" 16,	113¾	121¼	235	" 13,	111	100	211
" 17,	119¾	120¾	240½	" 14,	130½	125½	256
" 18,	124	125	249	" 15,	121½	127¾	249¼
" 19,	127¼	127½	254¾	" 16,	121½	129¾	251¼
" 20,	129	125	254	" 17,	120	131¾	251¾
" 21,	132¼	126½	258¾	" 18,	124	129½	253½

TABLE—*Continued.*

Date.	Milk Weighed.			Date.	Milk Weighed.		
	Morning.	Evening.	Total.		Morning.	Evening.	Total.
June 19,	123½	131¼	254¾	Aug. 7,	83	96	179
“ 20,	122	130¾	252¾	“ 8,	94	94	188
“ 21,	112½	129¾	242¼	“ 9,	88	101	189
“ 22,	121¾	129¼	251	“ 10,	94	100	194
“ 23,	121½	125¾	247¼	“ 11,	96	102	198
“ 24,	112½	124	236½	“ 12,	95	93	188
“ 25,	117	121¼	238¼	“ 13,	100	96	196
“ 26,	110	125½	235½	“ 14,	92	100	192
“ 27,	113	126¼	239¼	“ 15,	95	103	198
“ 28,	112	119½	231½	“ 16,	94	85	179
“ 29,	112	124¼	236¼	“ 17,	86	104	190
“ 30,	108	122¼	230¼	“ 18,	92	95	187
July 1,	112	115¾	227¾	“ 19,	102	98	200
“ 2,	107	115	222	“ 20,	93	98	191
“ 3,	103	122	225	“ 21,	96	98	194
“ 4,	100	119	219	“ 22,	97	103	200
“ 5,	104	112	216	“ 23,	93	101	194
“ 6,	104	115	219	“ 24,	89	96	185
“ 7,	100	107	207	“ 25,	90	90	185
“ 8,	103	110	213	“ 26,	88	88	176
“ 9,	99	105	204	“ 27,	89	83	172
“ 10,	103	110	213	“ 28,	93	90	183
“ 11,	99	105	204	“ 29,	82	94	176
“ 12,	100	102	202	“ 30,	90	96	186
“ 13,	97	105	202	“ 31,	90	91	181
“ 14,	99	105	204	Sept. 1,	90	90	180
“ 15,	96	97	193	“ 2,	96	88	184
“ 16,	99	96	195	“ 3,	98	86	184
“ 17,	112	99	211	“ 4,	91	88	179
“ 18,	100	107	207	“ 5,	84	81	165
“ 19,	98	111	209	“ 6,	85	82	167
“ 20,	98	107	205	“ 7,	89	85	174
“ 21,	92	96	188	“ 8,	85	80	165
“ 22,	93	90	183	“ 9,	87	83	170
“ 23,	95	91	186	“ 10,	82	78	160
“ 24,	93	95	188	“ 11,	95	85	180
“ 25,	93	95	188	“ 12,	88	87	175
“ 26,	88	95	183	“ 13,	87	87	174
“ 27,	88	95	183	“ 14,	87	89	176
“ 28,	92	100	192	“ 15,	90	88	178
“ 29,	95	92	187	“ 16,	87	87	174
“ 30,	94	95	189	“ 17,	88	87	175
“ 31,	90	93	183	“ 18,	90	81	171
Aug. 1,	91	92	183	“ 19,	90	81	171
“ 2	92	91	183	“ 20,	82	92	174
“ 3,	86	92	178	“ 21,	89	94	193
“ 4,	95	90	185	“ 22,	93	94	187
“ 5,	92	96	188	“ 23,	97	92	189
“ 6,	95	87	182				

Total weight of milk for five months, 32,069 lbs.

I have sold at the different dates stated in the foregoing table seventy-nine cheeses, one thousand six hundred and twenty-three pounds, which brought me, delivered at the depot in West Brookfield, eleven cents per pound, within a fraction, say	$184 53
I have on hand seventy-six cheeses, one thousand three hundred and seventy-nine and a half pounds, on which I expect to realize twelve cents per pound, at the depot, the 1st of November, which, deducting the shrinking on those not now merchantable, say twenty-eight pounds, will amount to	162 18
I made butter from the milk the twenty-third day, and it yielded seven pounds, which, at twenty-five cents per pound, amounts to	1 75
	$348 46

I sold one of the calves, and raised five of them.

WORCESTER, ss., September 25, 1854.—Then personally appeared the before-mentioned William Robinson, Jr., and made oath that the foregoing statements, by him subscribed, were true.

Before me,

EDWIN WOODS, *Justice of the Peace.*

BARRE, 1854.

Statement of William W. Watson.

I offer for premium six cows, one of which is exhibited. They gave thirty-two pounds of milk each a day the first ten days in June, and made ninety pounds of butter.

The first ten days in September they gave twenty-two pounds each a day, which made seventy-one pounds of butter.

In June, July, and August I kept the morning's milk twenty-four hours, the night's milk twelve hours. In five months the six cows made one thousand four hundred and seventy-seven pounds of skim-milk cheese, which has been sold so as to average seven and a half cents per pound in market. The cows have had good pasturing, and been driven one mile to pasture each day, and have had no extra feed. Two of the cows calved in February, and four in March. I have raised five of the calves. They calved in March and April.

Barre, September 19, 1854.

Commonwealth of Massachusetts.

Worcester, ss. September 26, 1854.—Then the above-named William W. Watson made oath that the above statement, by him subscribed, is true.

Before me,

John A. Dana, *Justice of the Peace.*

HAMPSHIRE.

Report of the Committee.

The rearing of good dairy stock is an object of great importance to the farmer. The cow ranks high among our domestic animals. Probably no other is of more importance to us. She furnishes both the necessaries and the luxuries of life. To the farmer she is a source of both luxury and profit. How desirable, then, that, in rearing dairy stock, he should produce animals of the best qualities for his purpose! And the question, how this can be best accomplished, is one of much interest to breeders of neat stock. If "like produces like," too much care and skill can hardly be exercised by the breeder in the selection of his breeding animals. He should select such as have the style and qualities desired in their offspring.

In rearing heifers for the dairy, such should be chosen as have descended from good milking stock. It is not only important that the dam should have been a good milker, but equally so that the sire should have been bred from a good milking race. It is generally believed by breeders of experience that the male has as much influence upon the milking qualities of the progeny as the female. Hence the necessity of having well-selected males, as well as females, in attempting to rear good stock for the dairy. The breeder should not only use superior animals to breed from, but reserve for himself the better portion of their progeny. If a heifer shows an aptitude to fatten easily, she is generally considered worth more for the shambles than the dairy, and, consequently, goes into the hands of the butcher; while some hard-hided one, which could not easily be fattened, is reserved for the milk pail.

The opinion is very prevalent among farmers, that a heifer which takes on flesh rapidly will not make a good milker. Perhaps the fact that most good milkers become thin of flesh when in full milk leads to this opinion. But such cows generally fatten quickly when dry. It would seem that the fact of a heifer's fattening easily should lead to the belief that she would make a good cow for butter, her aptitude to fatten showing her system to be such that all the carbon of her food is not required for heat and respiration.

G. C. MUNSELL, *Chairman.*

HAMPDEN.

From the Report of the Committee.

The competitors for premiums of this description will ordinarily be found to be resident within a few miles of the place of exhibition, as it is undoubtedly true that driving cows a great distance is always attended with hazard, and not unfrequently productive of manifest injury. According to our recollection, all the cows exhibited were from three towns.

It might be desirable to stimulate a farmer in Chester or Brimfield to raise and keep good cows, even although he should feel unable to drive or transport them to a central point of the county. Might not the directors properly be authorized to examine, by some one or more of their number, all milch cows outside of an area of eight miles from the place of exhibition, and a class of premiums be provided for them? It strikes us that such an arrangement would have a direct tendency, not only to improve the character of the mothers of the unborn calves that may hereafter be found in Holland, Russell, Tolland, and Wales, but also to increase the list of members from those towns. We know that they already have excellent cows there; but the number of such should be increased.

We would add a general suggestion, whether competitors should not be required in all cases to set one or more days' milk, and to state the quantity and quality of the butter produced therefrom. Your present regulations put a cow whose milk has such limited butteraceous properties that a fly might swim the entire first day of June through a pan of it, without clogging his limbs, upon a perfect equality with one whose milk may raise a cream as thick as the lid of a churn. It may be asked in reply to this proposition, Why make any further regulations, if those heretofore adopted are not observed? The proper answer, as it appears to us, is, that public notice should be given that all persons who desire to compete for these premiums must apply to the secretary on or before the 15th of May, when the circulars could be delivered.

N. T. Leonard, *Chairman.*

Remarks by the Directors.

It will be seen by the above report that the committee have been compelled to renew the annual complaint of non-compliance, on the part of those competing for the premiums offered for this class of animals, with the conditions prescribed by the society. It is a source of deep regret to the directors that the cause for such complaint should still exist. It has for many years been a matter of deep solicitude with this society to avail themselves, through the statistics anticipated upon this subject, of some reliable data of facts and figures upon which some correct estimate might be established in relation to the value of the different breeds of cows for the dairy. This fact alone, once established, would be worth more to the members of the society than the whole amount of premiums offered upon the entire class of milch cows. To obtain these facts, and others most intimately connected with the subject, a circular, embracing certain interrogatories calculated to draw out such information, has been furnished to every one desirous of contesting for the premiums, with this provision: No premium will be awarded by the committee, or approved by the directors, except upon satisfactory evidence in writing. Now, then, this becomes a matter of bargain and contract between the parties; and is there any just claim upon the society until the conditions are fulfilled? The bare declaration, that a certain cow has produced twenty pounds of butter in one week, is unsatisfactory testimony, not because it is doubted, but because it is not sufficient. The breed of the animal, her age, the quantity of milk in quarts and pounds daily, and how she was fed during the time of trial, are a part of the evidence, as full of importance to the society as the fact of her uncommon product of butter. These are the facts which we should feel proud, through our annual report, to communicate to the Board of Agriculture; and if they exist, there is no satisfactory reason for their concealment.

The remark often made as an apology for non-compliance with the requirements of the society, that it is too much trouble, or it was not convenient, is too puerile for any judicious person ever to offer. If the premium were even a gratuitous offering, the individual would be amply compensated for all his time and trouble in obtaining the facts by the possession of them. Had one of the successful contestants given his assertion, and pledged his integrity to the committee for its veracity, that the product of milk from his cow for one year had realized to him more than two hundred dollars, it might have enlarged the pupils of their eyes, but it would have caused a tingling in their ears. Sustained as the declaration is by figures, it now becomes a fact on sight; and the statement is given in detail, that every one disposed may estimate for himself the "trouble and inconvenience" of keeping such a memorandum for twenty days, as also the value of the reward offered for it in the premium list. Most of the statements furnished give only the number of pounds of milk per diem; some state that the milk was sold, but whether by the pound or quart is not mentioned. One-half of the trouble of keeping a memorandum was thus overcome by weighing it; the remainder when the milk was sold, if sold by measure.

The suggestion offered by the committee, that all competitors should be required to give one or more days' milk to a trial of its butteraceous properties, is entitled to the consideration and the action of the society. The directors are only the executors of the will of the society: what they determine, is ours to execute. The society has spoken it, that no premium shall be awarded without satisfactory evidence of the fulfilment of the conditions prescribed. Sustained in our conclusion by the opinion of the awarding committee, and by the decision of the trustees of other societies under similar circumstances, the directors have decided that the premiums recommended by the committee cannot be approved by them, except in the case of A. M. Carleton and J. H. Demond, whose satisfactory evidence entitles them to receive the premiums awarded.

Statement of Amos F. Carleton.

In reply to the various interrogatories of the society, I will state that the cow which I offer for premium I have owned for two years and seven months. She was six years old last January. She is of Durham and Ayrshire stock. I have usually sold her milk, but have tried it for butter, and found the product of seven to eight quarts to be one pound of butter; her feed has been good pasturage during the summer, green corn fodder and pumpkins in the fall, and good English hay, with some dry corn fodder and about a peck of common turnips per day and no meal in winter; and the price I have obtained for her milk, all of which I have sold except what was required for my family use, has been four cents per quart for four months, and five cents for the balance of the year, taken at my house. The cow calved on the 19th of August, and her calf was sold on the 22d of August, for the purpose of being raised. In the following table will be found a statement of the product of the cow, in conformity with the rules of the society:—

1853.	Morning.	Night.	Total.	2¼ lbs. to the quart.
Sept. 10,	14 pounds,	19 pounds,	33 pounds,	14⅔ quarts.
" 11,	16 "	17 "	33 "	14⅔ "
" 12,	15 "	19 "	34 "	15 1/9 "
" 13,	15½ "	19½ "	35 "	15 5/9 "
" 14,	15 "	20 "	35 "	15 5/9 "

1853.	Morning.	Night.	Total.	$2\frac{1}{4}$ lbs. to the quart.
Sept. 15,	$16\frac{1}{4}$ pounds,	19 pounds,	$35\frac{1}{4}$ pounds,	$15\frac{2}{3}$ quarts.
“ 16,	$15\frac{1}{2}$ “	20 “	$35\frac{1}{2}$ “	$15\frac{7}{9}$ “
“ 17,	16 “	$18\frac{1}{2}$ “	$34\frac{1}{2}$ “	$15\frac{1}{3}$ “
“ 18,	17 “	$17\frac{1}{2}$ “	$34\frac{1}{2}$ “	$15\frac{1}{3}$ “
“ 19,	16 “	$19\frac{1}{4}$ “	$35\frac{1}{4}$ “	$15\frac{2}{3}$ “
“ 20,	16 “	20 “	36 “	16 “
			381 “	$169\frac{1}{3}$ “
1854.				
June 10,	11 “	15 “	26 “	$11\frac{5}{9}$ “
“ 11,	12 “	$15\frac{1}{2}$ “	$27\frac{1}{2}$ “	$12\frac{2}{9}$ “
“ 12,	$10\frac{1}{2}$ “	15 “	$25\frac{1}{2}$ “	$11\frac{1}{3}$ “
“ 13,	11 “	15 “	26 “	$11\frac{5}{9}$ “
“ 14,	$10\frac{1}{2}$ “	15 “	$25\frac{1}{2}$ “	$11\frac{1}{3}$ “
“ 15,	11 “	$14\frac{1}{2}$ “	$25\frac{1}{2}$ “	$11\frac{1}{3}$ “
“ 16,	11 “	15 “	26 “	$11\frac{5}{9}$ “
“ 17,	10 “	15 “	25 “	$11\frac{1}{9}$ “
“ 18,	12 “	12 “	24 “	$10\frac{2}{3}$ “
“ 19,	11 “	13 “	24 “	$10\frac{2}{3}$ “
“ 20,	11 “	13 “	24 “	$10\frac{2}{3}$ “
			279 “	124 “

Below I give the product of my cow for one year from the time of taking off the calf:—

1853.	Days.	Av. qts.	Total qts.		
Aug. 2 to Sept. 1,	9	$14\frac{1}{2}$	$130\frac{1}{2}$	at 4 cents,	$5 22
Sept. 1 “ Sept. 10,	9	$14\frac{1}{2}$	$130\frac{1}{2}$	“ 5 “	6 52
“ 20 “ “ 30,	10	$15\frac{1}{2}$	155	“ 5 “	7 75
Oct. 1 “ Oct. 31,	31	$15\frac{1}{2}$	$480\frac{1}{2}$	“ 5 “	24 03
Nov. 1 “ Nov. 30,	30	$15\frac{1}{4}$	465	“ 5 “	23 25
Dec. 1 “ Dec. 31,	31	13	403	“ 5 “	20 15
1854.					
Jan. 1 “ Jan. 31,	31	$11\frac{1}{2}$	$356\frac{1}{2}$	“ 5 “	17 82
Feb. 1 “ Feb. 28,	28	10	280	“ 5 “	14 00
March 1 “ March 31,	31	10	310	“ 5 “	15 50
April 1 “ April 30,	30	11	330	“ 5 “	16 50

1853.	Days.	Av. qts.	Total qts.		
May 1 to May 31,	31	13	403	at 4 cents,	$16 12
June 1 " June 10,	9	12	108	" 4 "	4 32
" 21 " " 30,	10	10	100	" 4 "	4 00
July 1 " July 31,	31	7	217	" 4 "	8 68
Aug. 1 " Aug. 22,	22	5	110	" 4 "	4 40
Add 169⅓ qts., Sept. 10 to 20, 1853,			169⅓	" 5 "	8 47
" 124 " June 10 to 20, 1854,			124	" 4 "	4 96
			4272⅓		$201 69

Her time for calving this season expires the 29th inst. She has been milked regularly, morning and evening, until this morning, when I milked her for the last time before calving; and she gave two quarts this morning.

Chicopee Falls, September 25, 1854.

Statement of J. H. Demond.

In compliance with the request of the president of the society, I furnish you with a statement of the product of my Pynchon cow, which was on exhibition only at the late cattle show. She attracted much attention and received many compliments; in return for which she presented me with a fine calf a few hours after the show. Her daily product of milk for the month of October, 1854, was as follows:—

Oct. 1,	measured	20½	quarts.	Oct. 17,	measured	22	quarts.
" 2,	"	21	"	" 18,	"	21½	"
" 3,	"	21½	"	" 19,	"	21½	"
" 4,	"	21	"	" 20,	"	22	"
" 5,	"	21½	"	" 21,	"	22	"
" 6,	"	22	"	" 22,	"	22½	"
" 7,	"	22	"	" 23,	"	21	"
" 8,	"	22½	"	" 24,	"	21½	"
" 9,	"	22	"	" 25,	"	22	"
" 10,	"	21½	"	" 26,	"	22	"
" 11,	"	22½	"	" 27,	"	21½	"
" 12,	"	21	"	" 28,	"	22	"

Oct. 13,	measured	22	quarts,	Oct. 29,	measured	22	quarts,
" 14,	"	22½	"	" 30,	"	21½	"
" 15,	"	22½	"	" 31,	"	22½	"
" 16,	"	22	"				
						675½	"

Making a total of six hundred and seventy-five and one-half quarts, which was sold at five cents, amounting to thirty-three dollars and seventy-seven cents. The cow weighed on exhibition day one thousand five hundred and fifteen pounds; and her milk for the month of October, at two and a quarter pounds per quart, weighed one thousand five hundred and nineteen pounds, and this without extra feed.

The two-year-old heifer (No. 5) offered by me for premium was from my own stock, sold when a calf, and purchased back when a yearling for the sum of thirty dollars. She is now two years and three months old, of mixed breed, Durham and "native," principally Durham. She calved in May last, has fed with my herd of fifteen cows in ordinary pasturage, has had no extra feed except in September, when, in common with the others, she received a share of green corn fodder daily. Her product of milk from the 10th to the 20th of June, 1854, and from the 10th to the 20th of September, 1854, is subjoined:—

June 10,	weighed	34	pounds.	Sept. 10,	weighed	23	pounds.
" 11,	"	34½	"	" 11,	"	22½	"
" 12,	"	35	"	" 12,	"	23	"
" 13,	"	34½	"	" 13,	"	23	"
" 14,	"	34½	"	" 14,	"	22½	"
" 15,	"	33½	"	" 15,	"	21	"
" 16,	"	34	"	" 16,	"	21½	"
" 17,	"	33½	"	" 17,	"	21½	"
" 18,	"	33	"	" 18,	"	21	"
" 19,	"	33½	"	" 19,	"	21	"
		340	"			220	"

This quantity, at two and one-fourth pounds to the quart, gives one hundred and fifty-one and one-ninth quarts. Sold at four cents per quart, amounting to six dollars and four cents for the ten days of June, being an average of fifteen and one-ninth quarts per day; and for the ten days of September the total is ninety-seven and seven-ninths quarts, sold at five cents per quart, and amounting to four dollars and eighty-eight cents, being an average of very nearly ten quarts per day, making a total of ten dollars and ninety-two cents.

SPRINGFIELD, September 26, 1854.

BERKSHIRE.

From the Report of the Committee.

Our farmers of late have made very great improvement in the breed and quality of their cows. This is as it should be. Many cows may now be found that will produce from ten to fifteen pounds of butter per week, for two or three months, on grass alone; but no farmer has a whole herd of such cows. Our good cows are mostly cows of accident. These things ought not so to be. There are some honorable exceptions, however, among our most intelligent farmers. The Ayrshire stock has, in a few instances, been introduced, and it is believed will prove beneficial to the dairy farmers of the county.

Of milch cows, we have awarded the first premium to A. W. Kellogg, of Pittsfield, for a Durham cow seven years old, nine dollars. This cow calved the 3d of May last, and averaged in the month of June fifty-two and a half pounds of milk per day, and made the first week in June seventeen pounds thirteen ounces of butter. She averaged in September forty-four pounds of milk per day, and the first week in September made sixteen pounds four ounces of butter. Her keeping was good pasture in June, and meadow and pasture in September.

E. AXTELL, *Chairman.*

Report of the Committee appointed to award the State Premiums on Dairies.

The Berkshire Agricultural Society received a very generous proposition from the Massachusetts State Society of one hundred and fifty dollars, to be divided into three premiums, of seventy-five, fifty, and twenty-five dollars each, for the best exhibition of a dairy of not less than six cows, and a written statement answering the interrogations accompanying the proposition.

The Executive Committee of the Berkshire Agricultural Society appointed a special committee, consisting of Justus Tower, of Lanesboro', Robert Colt, of Pittsfield, and D. D. Kendall, of Lenox, to carry out the wishes of the State Society.

After attending to the duties assigned us, we would report that there were four competitors, all of whom did great credit to themselves by the exact manner in which they answered the interrogations propounded by the Executive Committee; also by the exhibition of six cows each from their respective dairies, on the show ground, at the society's annual fair.

After a thorough investigation of all the statements of each competitor, and examination of the cows exhibited, we were unanimous in our conclusions in awarding the premiums as follows:—

J. D. Northrup, of Lanesboro', for the best exhibition from his dairy of six cows, and for the best return of profits and good management, seventy-five dollars.

S. W. Lincoln, of Cheshire, for the second best do., fifty dollars.

Henry Dresser, of Stockbridge, for the exhibition of six beautiful blooded cows, and best experiment in making butter, twenty-five dollars.

Accompanying this document are the written statements of the competitors:—

Statement of J. D. Northrup.

My dairy consists of twenty-four cows. Most of them are the so called "natives," with a cross of the short-horn Durham, which I consider a decided improvement for milk. Nearly all dropped their calves in April.

I milked from the twenty-four cows in seven days, commencing the first week in June, five thousand three hundred pounds of milk, and used in my family forty-nine pounds, leaving five thousand two hundred and fifty-one pounds, from which I made four hundred and sixty-seven pounds of cheese and ten pounds of butter. The night's milk was set in tubs over night, and the cream taken off in the morning; the milk was then made into cheese with the morning's milk, the twenty-four cows making a cheese weighing sixty-seven pounds per day, which is two and three-quarters pounds to a cow, and taking eleven pounds of milk to one pound of cheese, weighing the cheese at twenty-eight days old. One gallon of milk will make a pound of cheese from the press. My cheese nets me nine and a half cents per pound, and butter twenty cents per pound.

467 pounds of cheese, at 9½ cents per pound, .	$44 36
10 pounds of butter, at 20 cents per pound, .	2 00
	$46 36

Making the income of each cow one dollar and ninety-two cents per week, or twenty-seven and a half cents per day.

I milked from the twenty-four cows in seven days, the first week in September, three thousand three hundred and sixty pounds of milk, and made three hundred and thirty-six pounds of cheese and ten pounds of butter—ten pounds of milk to one of cheese.

336 pounds of cheese, at 9½ cents per pound, .	$32 02
10 pounds of butter, at 20 cents per pound, .	2 00
	$34 02

making one dollar and forty-one cents per week, or twenty cents per day, to each cow.

The six cows I offer for premium were selected from my dairy of twenty-four cows. I commenced the first week in June and September, and weighed the milk seven days in succession.

	Age.	Weight per day in June.	Per week.	Weight per day in Sept.	Per week.
No. 1,	8	37	259	24	168
" 2,	8	35	245	25	175
" 3,	8	45	315	30	210
" 4,	10	47½	332½	27	189
" 5,	11	39½	276½	26½	185½
" 6,	12	43	301	31	217
			1,729 pounds,		1,145½

Making in June 157 pounds of cheese, at 9½ cents per pound, ...	$14 91
4 pounds of butter, at 20 cents per pound, . .	80
	$15 71
Making in September 114½ pounds of cheese, at 9½ cents per pound, ...	10 80
4½ pounds of butter, at 20 cents per pound, . .	90
	$11 70

In September, ten pounds of milk made one pound of cheese.

My pastures are upland, and yield sweet feed. I fed, in the month of June, all the whey from the milk made into cheese, without any meal. In September, my pastures being very much dried up, I fed all the whey, with one quart of meal to each cow, and also ten pounds of corn fodder to each cow per day.

I commence feeding my cows in the spring, before calving, with three quarts of meal each per day, until the feed in the pasture is good.

I consider the best mixture of grain, ground into meal, for milk, is equal quantities of rye, buckwheat, and oats. For the last ten years I have not made less than five hundred pounds of cheese and twenty pounds of butter to each cow; and one year I made six hundred and forty pounds of cheese and twenty pounds of butter to each cow.

A cow will give more milk on good fresh grass than any other feed. When the grass begins to fail, I make up the deficiency by extra feed of meal and corn fodder. I feed all my whey to my cows. I let them run dry four months, and during this time I give them no extra feed, always keeping salt before them.

Process of making Cheese and Butter.—At night the milk is strained into tubs of twenty gallons each. During the warm weather I use cans holding about fifteen gallons each, filled with ice or cold water, and put one into each tub of milk. In the morning the cream is taken off the milk, and the morning's milk is added to it, which warms it sufficiently to receive the rennet. In thirty minutes it is stirred up; then the whey is dipped off. It is heated to one hundred degrees for scalding the curd, and then stands thirty minutes longer; the whey is then drained off and stirred thoroughly, and then salted with one common tea-cup full of salt to sixteen pounds of curd, and put into the press. In four hours it is turned, and pressed twenty hours longer; then put on the shelf, dressed and turned, until fit for market.

One process for making butter is this: After the cream is taken from the milk it is put into a stone jar, and kept in the ice house or cellar, and churned as often as once a week. After the butter is taken from the churn it is rinsed in cold water to get out the buttermilk, and then worked over three days in succession, properly salted. It is then ready for use or keeping.

LANESBORO', October 2, 1854.

Statement of S. W. Lincoln.

The six cows presented for your examination were bred and raised by myself and others in this vicinity. They are what we call the "natives," crossed a little with English blood. They dropped their calves from the 10th of April to the 22d of May. Below you will find their ages, and the average amount of milk each cow gave per day for seven days, commencing the first day of June and September:—

Names of cows.	Age.	Pounds per day in June.	Pounds per week.	Average per day in Sept.	Pounds per week.
Jenny Lind,	8	36	252	23½	164½
Mayflower,	7	36	252	22	154
Eliza,	8	36	252	19	133
May Bell,	5	32	224	20	140
Little Eva,	4	34	238	19½	136½
Victoria,	3	30½	214	17½	122½
			1,432		850½

Averaging thirty-four and a half pounds per day in June, and a little over twenty pounds of milk per day in September, for each cow.

This is making in June, out of fourteen hundred and thirty-two pounds of milk, one hundred and sixty-five pounds of cheese, at nine and one-half cents per pound, equal to fourteen dollars and eighty-five cents; and making in September, out of eight hundred and fifty and one-half pounds of milk, one hundred and six pounds of cheese, at nine and one-half cents, equal to ten dollars and seven cents; taking less than nine pounds of milk to one pound of cheese. I weighed the cheese at fourteen days old. It made in June twenty-three and nine-sixteenths pounds per week to each cow,—a little short of four pounds per day,—and in September fifteen and two-sixteenths pounds per week to each cow, or two and one-half pounds per day.

I fed to my cows in June four quarts of wheat shorts, with whey, per day to each one of them. In September, two quarts of shorts wet in water and a handful of corn fodder each.

I feed in the spring, before and after calving, two quarts of meal (rye and oats ground together) to each cow. My pasture produces good sweet feed; it suffered with the drought after June. The six cows have made this year, up to the 1st of September, two thousand five hundred pounds of cheese, and thirty pounds of butter to each cow, and will make one thousand pounds more of cheese. I have made, for the last five years, five hundred and fifty pounds of cheese to a cow, and thirty pounds of butter.

Statement of Mrs. S. W. Lincoln.

Manner of making Cheese.—The milk at night is set in tubs; and if the weather is warm coolers are set into the milk, filled with cold water or ice. In the morning the cream is skimmed off, put into milk and warmed, and then mixed with the night's and morning's milk, and warmed by pouring in hot water to a temperature of eighty-six degrees. Rennet is then added, sufficient to produce a thorough coagulation; then, in about forty minutes, the curd is cut into fine square pieces, and remains until the green whey begins to rise; then it is broken up with the hand. This operation is performed with great care, letting the curd pass gently between the fingers without squeezing it in the hand, as that would decrease the quantity of cheese. After settling, a quantity of whey is put into a kettle and warmed, and put into the curd, making it ninety-five degrees warm. Then the curd is again broken, the whey heated and put into the curd, so that the heat will be raised to one hundred and six degrees. It then remains, being stirred occasionally, until the curd becomes elastic, and, as old cheese makers say, "squeaks between the teeth." Then the whey is again drawn off, the curd cooled with cold water, and then salted with a tea-cup full of salt to sixteen pounds of cheese. It is then pressed twenty-four hours, being turned over in the time, and then removed to a cool dairy room, greased, colored according to fancy, and turned every day until cured.

CHESHIRE, October 3, 1854.

Statement of Henry Dresser.

My cows were bred and raised in Stockbridge. No food was furnished except good quality of old pasture.

Ruth, one-half "native" and one-half Durham, five years of age, calved May 23.

Primer, "native," Durham, and Devonshire, aged five years, calved March 26.

Betsey, one-half "native" and one-half Durham, aged five years, calved April 2.

Nancy, "native," aged five years, calved April 5.

Twins, "native" and Durham, aged seven years, calved February 7.

Weight of milk:—

	June 1st.		June 2d.		Sept. 1st.		Sept. 2d.	
Ruth,	47½	pounds.	49½	pounds.	37	pounds.	35	pounds.
Primer,	44	"	43	"	25½	"	25½	"
Betsey,	34½	"	35¼	"	25½	"	25¼	"
Nancy,	38	"	32	"	22	"	24	"
Twin,	32	"	30¼	"	26½	"	27	"
Twin,	31	"	29¼	"	26½	"	28½	"
		"		"		"		
	227	"	219¼	"	163	"	165¼	"

Whole amount of milk from six cows in June:—

June 1, 217¼ pounds.
" 2, 206¾ "
" 3, 200¼ "
" 4, 215¾ "

June 5, 222¼ pounds.
" 6, 229¾ "
" 7, 233¼ "

Whole amount of milk, . . 1,525¼ "

Whole amount of milk from six cows in September:—

Sept. 1, 163 pounds.
" 2, 165¼ "
" 3, 171¾ "
" 4, 177¼ "

Sept. 5, 150 pounds.
" 6, 157¼ "
" 7, 174½ "

Whole amount of milk, . . 1,159 "

Milk used for butter in June, one thousand four hundred and three and one-fourth pounds; in September, one thousand one hundred and fifty-nine pounds.

Amount of butter made the first seven days in June, fifty-eight pounds; first seven days in September, forty-five and one-fourth pounds. No cheese was made.

The milk used for other purposes in June amounted to one hundred and twenty-two pounds; in September, none.

STOCKBRIDGE, October 23, 1854.

It appears from the above statement that it takes twenty-five pounds of milk for one pound of butter. This is as well as the general average. Take a good, fair quality of milk, and good facilities for keeping it in the right temperature for raising cream, and twenty pounds will produce one pound of butter; and of some cows' milk sixteen or eighteen pounds will produce a pound of butter. There are not pains enough taken in this county, or, generally, in the State, in preparing a suitable place for the setting of milk, in order to obtain the greatest possible amount of cream. In order to do this, a right temperature should be maintained and proper quantities put into each vessel. From sixty to sixty-five degrees is generally thought to be the right temperature to be maintained to produce the greatest quantity of cream from the milk in the shortest time; and the sooner it can be extracted and made into butter, the sweeter and better it is.

It also appears from the foregoing report that two and one-half pounds of cheese were made from the same quantity of milk that it took to make one pound of butter by Mr. Dresser. Mr. Lincoln made more; but he weighed his cheese at fourteen days old, and Mr. Northrup at twenty-eight days old; and in taking out the shrinkage of fourteen days it amounts to about the same; and by these two experiments we may consider it well established, that ten pounds of milk will make one pound of cheese at one month old, and eight pounds from the press; and the same quantity of milk that makes two pounds of cheese will make one pound of butter.

All these experiments are worthy of comment, the competitors having been exact and very satisfactory to the committee.

Mr. Northrup's manner of conducting is worthy of imitation and special comment. From his twenty-four cows he looks for the income of his farm. All he raises, with the exception of what the family and team consume, is given to his cows to swell the amount of milk. His first care is on his cows and the manufacturing of cheese, and all other business is made subordinate to this one interest. His cows are milked regularly morning and evening, and as regularly fed. If he has a poor cow she is sold, and a better put in her place. He raises calves from his best milkers; and in this way he has a reliable dairy of cows. He has this year, and for several years past, realized from his twenty-four cows one thousand two hundred dollars per year, or fifty dollars to each cow, which pays him as good a percentage on capital invested as the best stock companies in the Commonwealth. In the opinion of your committee, there is a great failure with most of our farmers in not concentrating their business—turning their particular attention to one department, and making all others contribute to that. Thus he has a home market for all his grain and roots, and the slops of his house to swell the products of the dairy, the sheepfold, beef, or pork.

Mr. Lincoln's experiment is very full, and shows him to be master of his business and successful as a dairyman. We think his recipe for making cheese as good a one as we have ever met with, and worthy of commendation.

Mr. Dresser's experiment on making butter is a very good one. He made in June about nine pounds to a cow, and in September seven and one-half pounds to a cow, per week, without extra feed. His cows were the handsomest blooded ones on the ground, and added much to our exhibition. The committee would have been highly pleased, if, accompanying his statement, there had been a full account of his process in making butter.

In closing this report, we cannot refrain from alluding to the importance of still greater improvement in this department of agriculture. The products of the cow add much to the necessaries and luxuries of life. Milk and butter are indispensable in the department of cooking; and upon the table there is nothing sought for with more care, and enjoyed with better relish, than good milk, butter, and cheese. Berkshire has been celebrated many years for her good butter and cheese; but there has been a marked improvement the last twenty years, both in quantity and quality. There has been an increase from three hundred to five hundred pounds and upwards to a cow. There is more system in manufacturing cheese, more care in raising good milkers, and greater attention to learn the best manner of management, so as to derive the greatest possible profit. Much depends upon the feed, and as much in the manner of feeding. A good milker will always repay the extra feed and good care. She should never be under restraint or receive harsh treatment. Grass is the most natural food for milk. A little meal gives heart to the cow, and adds to the quantity and quality of the milk.

The so called native stock, or a cross of one-quarter Durham, is generally liked best by our dairymen. High-blooded cows are but little sought after. A handsome, well-built cow is not a certain indication of a good milker; broad hips and heavy hind quarters are one of the requisites to a good cow. Some of our most ordinary-looking cows prove the best milkers. A good cow for milk will, in almost all instances, grow poor in flesh during the time of a good flow of milk, and will have the appearance of a hard-worked ox in the fall; and the best of care and good feeding will not prevent her losing flesh, although they may keep her in good condition. This is a true and reliable indication of a valuable cow. The food increases the milk instead of the flesh; but when cows are dry, they increase in flesh very fast. The dairymen of Berkshire are becoming good judges of cows, and are skilful in their selections. A poor cow will run a man in debt; while a good cow is profitable to every family.

The committee very much regret that there were no more than four competitors. It was owing to its not being fully understood by our dairymen in season to commence their experiments. We have a large number of dairymen in our county. Had they all become competitors, they would have stood as good a chance as those who carried off the prizes; and should another opportunity be presented, the number of competitors would be large.

While we investigate any of the departments of agriculture, we find that improvement is becoming a characteristic of our farmers, and that the great bustle and onward march of the age is not independent of their aid and coöperation. They are the true stability, and on them depends the prosperity of our country, for they are the producers. How important, therefore, and honorable their calling! And while the mechanic and manufacturer are in deep study to investigate and make improvements in their calling, and the philosopher and vigilant student in solving problems in Nature and opening wide the laboratory of Science, may not the husbandman, too, participate in the stirring events of the age, and, by the aid of science and practical experiments, learn to reclaim his farm, and produce two spires of grass where but one grows now?

Most respectfully submitted,

JUSTUS TOWER, *Chairman.*

LANESBORO', October 26, 1854.

HOUSATONIC.

From the Report of the Committee.

The subject presented for the consideration of this committee is one of vast and increasing importance to the farmers of Berkshire County; and we could wish it had fallen to abler hands to decide its merits, and present the subject in its true light before the members of this association.

Although we cannot compete successfully with our neighbors of the vast west in the raising of grain to any great extent, yet we may rely upon the productions of the cow, and find a ready market at home for our improved stock, butter and cheese. These facts, we doubt not, are understood by most farmers; and hence the great increase in the number of cows within the limits of this society. But it is evident that there are other facts, which, although known, are not applied and brought into practice to such an extent as the importance of the subject demands. We refer to the difference in value between a good cow and an ordinary one, and the importance of breeding from stock possessing high milking qualities; and it will not be disputed that, while a good cow may have a bad calf, a poor cow is much more likely to have one. We will not attempt to prescribe rules or define marks for the breeding and selection of cows, but venture the assertion, that no individual who has observed closely, and has bred and selected with reference to good qualities, has failed to find his reward. Neither do we attempt to give the comparative value of a good cow and an ordinary one; but usually the difference in value is far more than the difference in price.

The whole number of entries for cows was twenty-three—all good ones; and your committee regret that the means of the society do not allow them to do justice to all the competitors.

The whole number of entries of heifers having had calves was eight. There were none of an inferior quality, and all of them of superior merit, of comparatively large size, and of great beauty of form and color. They presented a gratifying improvement over previous years.

ELIAS WRIGHT, *Chairman.*

NORFOLK.

From the Report of the Committee.

The Committee on Milch Cows have the satisfaction to report at this time that the contribution of stock, both in numbers and in point of excellence, has been superior to that of any former year. The whole number entered for premium was twenty-one. And although in this respect we may not suffer in comparison with older societies, still we cannot but feel that it is not what it should be, nor what we have a right to expect from Norfolk County; for, considering the ability and means that we so largely possess, together with the great inducements in a pecuniary point of view, it is but fair to say that we should equal at least, if not excel, any other county; for by our near proximity to the Boston market, together with those in our own immediate neighborhoods, we are enabled to realize as large, if not a larger, profit from the dairy, either by the sale of butter or milk, than almost any other section of the State. And coupled, too, with this, is another important consideration; which is the high price of good selected stock in our vicinity, enabling the farmer to go extensively and profitably into the rearing of blood and native stock of the very best that this or any other country affords. The supply of choice milch cows for sale never equals the demand. We are now importing from abroad blood stock at a cost of from two hundred to three hundred dollars per head, not a whit better than can be bred at home for half that money. It is with pleasure, however, that we can say that an interest is being awakened in this behalf, both as a matter of profit as well as for the gratification it affords. Much valuable stock is now being introduced that will be a credit to our county.

In the report of last year the committee endeavored to show the great importance attached to the care and keeping of stock, inasmuch as, by a proper regard to these, in the way of gentle treatment and judicious feeding, an ordinary quality of stock even may be so benefited and improved as to become profitable; while, on the other hand, by neglect of these, a stock possessing a high degree of excellence naturally may be so impaired and injured as to render it not only unattractive to the taste, but, as a matter of business, unprofitable and disastrous in its results.

As has been before stated, the exhibition, in point of excellence, as a whole, may be considered superior to that of any former year. Very fine specimens were presented of the Jersey, Devon, Ayrshire, Durham, and native stock. But it would perhaps be presumptuous, at any rate hazardous, to venture a decision as to which particular breed is entitled to the largest share of credit and confidence, inasmuch as each has its peculiar characteristics, as well as its ardent admirers. We will be content to give a passing notice of some of the most prominent.

And first, it may be said that the Jerseys are growing very much in favor in this vicinity. And although in quantity their yield of milk may fall below the average of any other breed, yet in quality it probably vastly excels all; so that this alone, other things being equal, must give this breed a commanding prominence with stock growers. Some very fine specimens were presented by Mr. Edward King, of Dorchester, Dr. Morton, of West Needham, and Mr. C. L. Cunningham, of Milton. Those owned by Dr. Morton had not been in his possession long enough to entitle him to the society's premiums; but, in view of their beautiful proportions and apparent merit, the committee have awarded a gratuity.

Of the Devons, there is much to be said in their favor. They are good feeders, of hardy constitution, and generally very handsome in their proportions. For the yoke, this breed is probably unequalled by any other; and for the dairy, particularly in the product of butter, they may be said to take a high stand; but their yield of milk, in quantity, as a general thing, will fall below either that of the Ayrshire or Durham. Benjamin V. French, Esq., of Braintree, exhibited a fine specimen of the Devon, and also a grade cow of great apparent excellence, both of which, from the representations given, entitle them to a very high rank in the class to which they respectively belong.

Of the Ayrshire, some very fine specimens were exhibited by Mr. Samuel J. Capen, of Dorchester. It may be said perhaps with great truth of this breed, that, as a whole, they are probably not excelled in their yield of milk by any other. They are hardy, easy to keep, and generally docile and of good proportion.

The Durhams presented by Mr. Capen were also possessed of much excellence. This is a breed of large growth, and generally require, to produce an equal quantity of milk, a more generous feed than perhaps any other breed; but by attention and liberality in this respect they may be made to yield in full proportion to their extra cost of keeping. Appended is a statement from Mr. Capen of the yield of one of his cows, to which we have awarded the first premium. Enoch Train, Esq., of Dorchester, presented a Durham cow and calf of high apparent rank; but as no written statement was submitted as to her yield, she was necessarily placed under another list of the society's premiums. Of the native and grades, some very fine animals were on exhibition.

Thus the committee have passed upon the different breeds without, as before said, feeling especially called upon to give an opinion as to which, all things considered, is entitled to the highest rank. Each has its peculiarities; and what by some would be considered a defect, would by others be overlooked as of no importance or objection; but that some breeds, taken as a whole, do possess substantial advantages over others, is a fact that, in the opinion of the committee, cannot be denied; and hence grows the necessity of a judicious selection, not only of a particular breed, but the most desirable and valuable animal in each of its respective breeds; for upon this, in a great measure, depends the success of the stock-grower or milk-producer.

Competitors should be reminded that, under the head of "Milch Cows," where the product of milk or butter is the criterion upon which to decide of their merit, that, by the rule of the society, a *written* statement is required in relation thereto; and in no case have the committee awarded a premium where a compliance with this rule has been neglected; so that, of the twenty-one on exhibition, only four were put into this list, from the fact that only four statements in writing were submitted. excluding, undoubtedly, stock of high rank, and that, but for this omission, would have been placed in competition, under this head, for the society's premiums. It is to be hoped that this will be remedied in future.

For stock, under the head of the different breeds, no certificate is required; but here, even, it would be of great service, inasmuch as the committee are obliged to rely almost entirely upon their own judgment and observation; and in very many cases, where the stock to be passed upon would seem to be of nearly equal worth, it must be obvious that to discriminate and judge justly is a most difficult undertaking. The number and amount of premiums at the disposal of the committee may be said to be liberal; yet we have indulged somewhat largely in the award of gratuities; it is believed, however, only in proportion to the amount of excellence of the stock exhibited.

There are other points that might be dwelt upon with profit in connection with this subject, but which, perhaps, would be more proper to come from some other source and in some other form. It is to be hoped that an elaborate and well-defined theory may be presented at some future time by the society upon the selection of breed, rearing and mode of keeping milch cows. At present there is so much difference of opinion upon these points, among even our most prominent and well-informed stock owners, that the conclusions to be arrived at are confused and unsatisfactory. There is also the subject of the comparative value of roots for winter feed with that of corn or other meal. It would be doing good service to have these, and other points that might be named in connection with the subject, considered and reported upon to the society.

JOHN H. ROBINSON, *Chairman.*

Statement of Mr. Capen.

The cow offered for premium by me is of the Durham breed, nine years old. She calved on the 30th of September, 1853. From the 15th to the 25th of the next October she averaged twenty-four quarts of milk per day, weighing fifty-four pounds. She was fed on grass and two quarts of meal and four quarts of shorts per day. From the 15th to the 25th of January she averaged sixteen quarts of milk per day.

DORCHESTER, September 26, 1854.

Statement of Mr. King.

The Alderney heifer exhibited by me I imported in July, 1853. She had a very long passage, (over fifty-five days,) and was extremely low in flesh on her arrival. She dropped her calf February 1, 1854, which is also on exhibition. I think, from observation, she is a fine specimen of the breed. The quantity of milk which she has produced from February 1 to September 25 averages a fraction over nine and a half quarts per day. I am not able to state the quantity of milk to make one pound of butter; but this I will vouch, that a quart of her milk will yield much more cream than any cow I ever owned or ever knew.

DORCHESTER, September 26, 1854.

BRISTOL.

From the Report of the Committee.

The committee call particular attention to the rules of the society respecting milch cows. At the recent show only five exhibiters placed in the hands of the committee statements concerning the yield in milk of their cows; and of these five only two—Mr. Allen, of Attleborough, and Mrs. Andrews, of Dartmouth—testified as to the butter qualities of their cows. It is absolutely necessary that the committee receive evidence of the *quality* of the milk; for upon that, rather than its *quantity*, must they rely to form a true opinion upon the merits of a dairy cow. The yield in milk can be increased by certain descriptions of feed to an almost incredible extent; but the cream, the truly valuable part of the milk, cannot be increased proportionably.

The committee were much interested in examining a lot of some fourteen cows exhibited by several persons, but all bred by Benjamin Rodman in New Bedford. These cows present a uniformity in points of excellence and general appearance that would be extraordinary if we attributed their resemblance to one another to mere accident; but it is easily understood by any one who has been accustomed to consider the value of attention and adherence to blood. The character of this family of stock has been established and maintained for many years. The cows are almost invariably good milkers, produce superior butter, and command good prices.

The feeling that a knowledge of the means by which one man has produced a desirable result can but be serviceable to others, warrants, your committee believe, a particular notice of a family of stock which has long maintained a good reputation, and, being reared in the county, can at any time be examined by all who desire to inform themselves of its merits.

The stock of Mr. Rodman presents to the farmer a plain, practical lesson on the *value of blood.*

Some twenty-five years ago Mr. R. owned a valuable Alderney cow. This cow was bred to Devonshire, a thorough-bred short-horn bull, imported by Mr. Rodman from the (at that time) famous herd of Mr. Whitaker, one of the most distinguished breeders in England. The produce of this cross was a cow which lived to a great age, and was invaluable as a dairy cow. From herself and her first calf, by Carlos, are descended all the animals of this family which we saw at the recent show. They were got by Ayrshire bulls of acknowledged excellence. The two original cows were alive until very recently. Neither of them ever produced an indifferent milker; and their dairy qualities have been transmitted to their descendants even distantly removed. From Whitaker's short-horns they inherit deep milking qualities; and from the Alderney, cream of rich color and delicious quality. Can the same be said of any yard whose owners have depended upon chance cows and drove bulls?

C. A. Church, *Chairman.*

WORKING OXEN.

ESSEX.

From the Report of the Committee.

The committee, in witnessing the performances, were convinced that it is not best, in order to test the merits of the oxen, that too heavy a load should be put to them, but one of such weight as to be hauled comfortably without too much forcing, and then the committee will be enabled the better to judge of their training.

The committee are sensible that many inconveniences attend the trial of working oxen at the time now appropriated for that purpose. It comes immediately after the ploughing match, and many of the oxen that are engaged in that are to compete in the trial of drawing; and, coming as it does in the middle and heat of the day, those cattle that have ploughed are not in the condition to compete with those that have not been thus exercised. Therefore those that come fresh to the work have the advantage over the others. There were many other inconveniences that arose in the minds of the committee; and if the exhibition in future is to continue two days, they would inquire whether an alteration of the time for the trial of working oxen is not worthy of consideration.

Nathan Tapley, *Chairman.*

HAMPDEN.

From the Report of the Committee.

The committee feel warranted in the assertion, that scarcely a single part of an agricultural exhibition is calculated to excite more attention, or is in itself more worthy of it, than long lines of thrifty and noble-looking working oxen. Town teams furnish one of the tangible indications of the standard of enterprise and improvement attained by the farmers of a town, exhibiting their progress in the same ratio that single entries of oxen show that of individuals. If it be an honor for one farmer in a town to excel in the exhibition of oxen worthy of premium, your committee deem it a far greater credit for a town to win public award, inasmuch as it gives pleasing evidence that the worth and valuable labors of the ox are suitably appreciated.

ALVIN FOWLER, *Chairman.*

FRANKLIN.

Report of the Committee.

The Committee on Teams have to report that but four teams were exhibited, and only three of those came within the rules of the society as competitors for premiums—that is, numbering twenty yoke.

The rain storm doubtless prevented other towns from participating in the chances for premiums, thus adding greater interest to the exhibition.

The one hundred and twelve yoke from Deerfield, Shelburne, Bernardston, and Montague, all showed great excellence; many yoke were very superior, and doubtless received due praise from the various committees on cattle for the stall and for fat cattle.

Your committee are unanimous in the opinion that the society is now old enough and strong enough to class the neat cattle equitably and satisfactorily; and they would most respectfully suggest the propriety of lessening the number of yoke to draw premiums, and, in future, of classing town teams as working oxen; for it is manifest that most of our farmers do not feel any inducement to compete with a few towns, who can cheaply send their fat cattle, and make, in the words of the society, "the best string of twenty yoke."

All that can be done should be, to induce our farmers to appreciate duly the great importance of exhibiting annually from every town in the county a sample of their best oxen before their natural forms are concealed by fat, when they are, in farmers' phrase, "in working order."

Of so much importance have well-formed working and other cattle been deemed by the French, that, at their first agricultural exhibition in 1850, fat cattle were entirely excluded; and the competition, so far as animals were concerned, was confined to breeding stocks and male and female horned cattle. The result is, the French shows from the first have been continually progressive. This success a recent English agricultural writer attributes to the fact that the French have wisely avoided the English error of bestowing too great a share of attention to over-fed stock—an error which the writer says brought much well-founded censure and ridicule upon the Royal Agricultural Show in England respecting the neat cattle there exhibited.

Our National Society, at its exhibition of cattle this month in Springfield, Ohio, in its instructions to judges, says, "We have the greatest regard to the symmetry, early maturity and size, and the judges are expressly required not to give encouragement to over-fed animals."

Your committee hope that every town in the county will, in future, be represented by at least twenty oxen in working condition. Surely the farmer raises no animal in favor of which so much can be said, nearly all of whose parts, with scarcely a particle of loss, can be applied to some useful purpose. In no way so cheaply and so conveniently as by such a representation from every town in the county can our farmers and cattle dealers judge which town in Franklin has oxen the best for work, the best in form and color, the best profitably to make "the most blood for chemical uses, the most hair for the use of the mason, the most fat for tallow, hide for leather, horn and bones for combs, knife-handles, ivory-black and manure, and the best flesh, the most substantial of all our dishes."

Your committee do not desire to have fat cattle excluded from our exhibitions or premiums: they only desire greater attention should be paid to, and a greater interest manifested in, town teams or working oxen.

Henry W. Clapp, *Chairman.*

FAT CATTLE.

HAMPDEN.

From the Report of the Committee.

The committee are unwilling to permit the opportunity to pass without calling the attention of the farmer to the important subject suggested by an inspection of these animals. Hampden County has for years furnished her full proportion of first-class cattle for the New England markets; but this can be done in future only by selecting the purest stock from which to rear our supply. The question, therefore, as to what breeds are most valuable for this purpose, is one of vital importance, and should enlist the most careful investigation; so that every farming man or boy who undertakes to rear a yoke of oxen will be thus enabled to make a judicious selection from those steers whose well-proportioned and perfect forms will best insure a compensating return for the labor and expense bestowed upon them. It must be admitted by every intelligent and practical observer that any requisite or given quantity of hay or meal fed to cattle of this description will produce a much greater percentage of profit than when fed to small, ill-shaped, and disproportioned stock, which, like the lean kine in Pharaoh's dream, will consume years of plenty, and be, after all, of little value. The selection of the best stock for maintaining an improved supply that will be equal to the demands of our day is therefore an indispensable condition of success.

Cyrus Frink, *Chairman.*

FRANKLIN.

From the Report of the Committee.

The great secret of successful feeding is to produce the largest amount of the best beef at the least expense; and to obtain the information necessary to accomplish this, or a near approximation to it, we must have the combined experience of a large number of the most successful feeders. That this information may be in the hands of all our farmers, we would recommend to all competitors for premiums to furnish for the committees an accurate statement of their mode of feeding from calves, if raised by themselves, till their animals are fitted for the stall. The meagre statements that were furnished for the committee we consider of but little value; but a well-defined account of their whole treatment and mode of raising we think would be of great practical importance.

The committee, in their reports, may tell you how a thing may be done; but we would rather be told how a thing has been done.

There were seven pairs of oxen presented to the committee for premiums whose average weight was four thousand and fifteen pounds per pair, all good cattle. There was a pair of five-year-old steers presented by Samuel Fisk, of Shelburne, whose peers it would be difficult to find, the expense of raising which, as stated by Mr. Fisk, besides hay and pasturage, could not exceed fifteen dollars. They were worked till the 1st of June last; weight four thousand three hundred and ten pounds. Moses Stebbins, of Deerfield, presented a fine pair of seven-year-old cattle, whose weight was four thousand two hundred and seventy-five pounds. D. D. and J. Whittemore, Jr., of Whately, and Almond DeWolf, of Deerfield, presented each a fine pair of five-year-old cattle. Whittemore's weighed four thousand and eighty pounds; DeWolf's four thousand and thirty pounds. Upon the last two pairs the committee were divided—two to three.

JOSEPH ANDERSON, *Chairman.*

BRISTOL.

From the Report of the Committee.

Although perhaps not quite in the line of our duty, we would suggest to those engaged in the business of raising beef the propriety and profitableness of planting such root crops as ruta-bagas, turnips, beets, &c., sufficiently early in spring to meet such an emergency as has occurred the past summer, and is more or less liable to occur every year. By so doing, farmers would be enabled to provide their stock with an abundance of succulent food in a time when it is much needed, and the quantity and quality of the beef would be much increased; and they would be enabled to get their cattle to market earlier in the season, and make a saving of hay and meal, the latter of which has this year cost about twenty-five per cent. more than usual.

THOMAS ALMY, *Chairman.*

HORSES.

ESSEX.

From the Report of the Committee.

The chairman of the committee, having paid considerable attention to the breeding and rearing of valuable horses, does not feel willing to leave a subject of such vital importance to the agricultural community without making a few general remarks, hoping that they may be instrumental in improving the character and condition of that much-abused and long-neglected, yet patient and faithful, friend and servant of man. Until quite recently, very little attention has been given to systematic horse-breeding in this country; and the consequence is, that we have few or no horses among us which can be considered strictly reliable for the purposes of breeding. Most of our valuable horses are the direct descendants of English stock that has been bred with the utmost care and study for centuries; and unless the strictest attention and judgment be given to the crossing of these animals, they very soon lose their most desirable qualities. Let us cross the best English stock with our best native stock, and we can create a class of animals adapted to our peculiar wants.

There are, at the present time, three prominent classes of horses in great demand with us. First, the gentleman's and business man's elegant, fast-trotting, powerful roadster, which can trot twelve or fourteen miles within the hour, or a single mile inside of three minutes. Second, the farmer's horse-of-all-work, which can plough, reap, mow, and go to mill and to meeting. Third, the slow, heavy, stout, and steady puller, which, whether hitched to the stone drag, the railroad car, or even to the trunk of an oak tree, is sure to start at the word. Each of these classes differs very materially from the others, and should never be crossed with each other.

The fast and elegant trotting horse, whose pedigree proves him to have been bred from trotting stock for several generations, when crossed with a mare of similar qualities seldom or never fails to communicate to the offspring the qualities of the parent. But when the fleet roadster is crossed with the draught horse the offspring is neither a roadster nor a draught horse, but a miserable, uncomfortable, and useless thing. Such colts are almost invariably foaled with an overgrown body, and with legs altogether too light and weak to support it. Being consequently too lazy or too clumsy for the carriage, too feeble or too nervous for the plough or the drag, they pass their whole lives in the hands of jockeys, and are "dickered" from one to another, till at last death comes to their relief and consigns them to their proper receptacle—the compost heap.

It is as easy to raise a good horse as a bad one, and a thousand times more agreeable, as every one who has tried it knows. But, in order to do this, we must be sure upon the start that the fountains are pure, or all is labor lost, and worse than lost. If we wish to raise a perfect colt, we should shun the mare or horse which has a spavin, ringbone, curl, chest-founder, contracted feet, or any disorder that is capable of being transmitted to the offspring. Many will say that they have raised sound colts from unsound stock. But be not deceived by such statements. The principles of breeding are fixed and immutable; "like will produce like;" and although a sound foal may occasionally be dropped from an unsound mare, yet the unsoundness is born in his flesh and is lurking in his veins, and sooner or later will start out and claim its victim. Where one escapes a hundred fall. Breed from sound stock, and nothing else.

In regard to the class of horses that command the highest prices in the market there can be but one opinion. It is unquestionably the class of fast-trotting horses; and in support of this assertion I have only to say that there are at this moment, within four miles of Boston, three horses, whose respective prices are three thousand, five thousand, and seven thousand dollars. I refer to the "Black Hawk Maid," "Know Nothing," and "Ethan Allen," all of which are colts of the Vermont "Black Hawk," which, take him for all in all, the world never produced his equal. He has proved himself the horse of horses, the *ne plus ultra* of the equine race. Breeders who are raising colts of his get out of sound, fast, well-formed and good-blooded mares, may rest assured that they have animals of no ordinary value.

We are now living in the age of steam and electricity. It is emphatically a fast age. The days of slow coaches are past and gone; and the stubborn man who still persists in driving his own slow team is left to experience chagrin and mortification when he finds himself distanced and doubly distanced by the fast nags that shoot in ahead of him. There is most unquestionably a growing demand throughout the country, by all classes, for elegant and fleet horses. Time was when the demand came only from the fancy and sporting circles; but it is not so now. It is no uncommon thing for merchants and professional men in our large cities to pay a thousand dollars for a horse; and the demand is more than equal to the supply, even at such prices.

Years ago, when railroads were first going into operation, we were told that there would be no more call for roadsters; but, from that time to the present, no man has ever seen the day when the supply of fleet roadsters was equal to the demand. Unlike almost every thing else, a good horse can always find a purchaser. The saying, that "a good horse will always sell," has become proverbial; and I candidly believe that if a Horse Breeders' Joint Stock Company should be organized, with a capital of one hundred thousand dollars, and managed by skilful and experienced breeders, it could be made to declare in a few years larger dividends than any cotton or woollen manufactory in the country with the same amount of capital.

I have been informed by the owner of Black Hawk that he has for several years received annually for the services of that horse upwards of twenty-five hundred dollars, which would be the interest of more than forty thousand dollars. The celebrated mare Lady Suffolk has just dropped a foal sired by Black Hawk; and I have not the least doubt that the owner of this colt could receive for it, as soon as it is weaned, one of the best farms in Vermont. Lady Suffolk and Black Hawk are both American bred horses, strongly tinctured with English blood, and are probably the best horses in the world. But there is no reason why others cannot be raised which shall equal, or even surpass, them; and if breeders will go to work systematically, and use as much capital, judgment, skill, and experience as are used in most branches of business, they cannot fail to be amply remunerated.

Why will not some of our wealthy Essex County farmers, who are fond of making good investments, show us at our next agricultural exhibition one of the best stallions that can be bought in America?—such a one, for instance, as will answer the following description: His weight must be not less than one thousand pounds, nor over eleven hundred pounds. For color, black, bay, or chestnut would be preferable, without a white hair, if possible. His age may be any where inside of twenty years, if healthy and vigorous. He must have a sharp ear, bold eye, placed low down in the head, wide forehead, large nostril, sharp shoulder, long, wide hip, sloping gradually towards the tail, full across the loins, full breast, wide knee, low hock, wide, flat cannon, pastern tolerably long, hoof wide, but not flat. He must be able to trot a mile in two minutes and forty seconds; and his pedigree must be traced back through five generations, all from stock of good blood and perfectly sound. If such a horse were brought into this county he could easily earn two thousand dollars per year, and would be to the agricultural community of inestimable advantage and value.

I am aware that some conservative friends of agriculture (judging from the tenor of my remarks) will pronounce me a fast reporter. And, in reply, I have only to say that my aim has been simply to point out to the breeder the safest course for him to pursue, so far as the investment of his money is concerned. This mania for speed may result in good or evil, according to the use or abuse that may be made of it.

JOSIAH CROSBY, *Chairman.*

WORCESTER.

From the Report of the Committee.

It is only within a very few years that the attention of our farmers has been turned to the breeding of horses, or that any exhibition of which the society would not be ashamed could be produced in the class of breeding mares and colts; but now, all over New England, an unparalleled interest has been excited, and no agricultural fair is thought worthy a moment's notice which has not provided the means to show and test the qualities of the horses and colts. Our society, ever watchful of the interest of the agriculturist, in whatever channel his efforts shall be turned, has, just at the right time, lent its aid to this branch of his production, and has offered him the same tangible inducements to excel in this as in any other department of his skill and labor.

The forty-one entries which this year appear on the list of the committee show, on the part of the farmers, that their efforts are appreciated, and give an earnest that the third year's show will exceed the present as much as this has the first; and, for the credit of the exhibiters and further encouragement of the society, your committee would distinctly state that not a single animal has been entered for their examination which did not reflect credit upon its owner and upon the society which we represent.

Besides the increasing interest which this year's exhibition manifested in the rearing of fine horses, the committee notice with great pleasure the pains taken by the exhibiters to breed their mares to stallions of substantial qualities, good pedigree, and superior speed and strength.

Not a single weedy, leggy full-blood has been represented here to-day. And though the committee would by no means decry blood as the bar to all improvement in stock, yet for trotting stock, which is the sole staple of our market, too close breeding to racing stock has not shown sufficient substance and constitution to answer the demand of the New England breeder, whose object must be, the production of that race of stout-limbed, hardy, compact roadsters, known the whole world over as American fliers and Yankee trotting horses.

RUFUS WOODWARD, *Chairman.*

BERKSHIRE.

From the Report of the Committee.

The Committee on Horses present the following report:—

There was an unusually large number of horses entered for premium this year, plainly showing the increased interest in the rearing and training of this noble animal.

There were three stud horses, fifteen single horses, and seventeen pairs of horses, in all fifty-two horses, entered and competing for seven premiums.

The committee consider it the best show of horses ever exhibited here, and feel that possibly they may have erred in giving their awards; but it must be considered that it was extremely difficult, with the limited time they had, to satisfy themselves fully as to the merits of so many horses. The number of premiums may be thought quite too small for so large an entry as was exhibited the present year; but the bringing together of so many fine animals, and exhibiting them to the public, is of far more value than the mere award of a premium. The community cannot be otherwise than benefited by such a show.

SOCRATES SQUIER, *Chairman.*

HOUSATONIC.

From the Report of the Committee.

The exhibition of this year in our department was better than ever before. The entries were far more numerous than usual; and, in point of quality, we think our horses will successfully compete with those of more pretentious exhibitions.

In awarding premiums upon the fine display of carriage horses, we have regarded age, style, speed, size, action, training, and general movement. Many pairs of horses may show finely in a half day's exhibition, and still give manifest evidence of the want of essential excellence and value. Of carriage horses there were six entries; and your committee had much difficulty in coming to a satisfactory result when called upon to select for superior excellence.

Of farm horses there were sixteen entries, many of the span of marked superiority. We regarded all those combined qualities which to some extent, independent of merely showy characteristics, would render them practically useful and valuable harnessed to the wagon, the plough, the sled, or the carriage, for market or meeting. We ask, for easy and manageable action, strength and endurance, combined with the well-known points which give value to the matched team, whether designed for the uses of pleasure, convenience, or simply agricultural labor.

Of single horses there were seven, and of single mares eight, entries.

The beautiful and convenient grounds now provided for the exhibition, and, we are proud to say, the property of the society, afforded the best opportunity to display horses; while the race track gave "ample room and verge enough" to show their speed and movement. We doubt not that many of the horses exhibited to which we have awarded no premiums might make "better time" than some more successful; but, with all deference to the sports of the turf, we shall not be called upon to make that element alone our criterion until our friends and brother farmers exchange their day books for betting books; which may Heaven forbid.

JOEL BALDWIN, *Chairman.*

SHEEP.

ESSEX.

Report of the Committee.

There were three entries of sheep, two of which only were for premium. A lot of Chinese lambs were presented for exhibition by Wm. and T. Johnson, of North Andover. They were dropped on board the ship Fleetwood, on her passage home from Shanghae, when seventy days at sea. These lambs evidently have no relationship to either of the varieties of fat-rumped sheep which prevail in China, but belong to a class of sheep smaller in size, lighter in carcass, shorter in the leg, and more European in character. They produce a tolerably fine, and in that country very useful, long wool. The committee saw nothing in them to recommend above our own sheep. They are peculiar for their fecundity; but, in a country where sheep are generally so poorly fed that they are hardly able to mature *one* fat lamb, this may be an objection rather than a recommendation.

A buck and ewe, (imported from Seville in 1853,) with twin lambs and a pair of twin cossets of the same breed, were presented for premium by Jarvis Slade, of North Andover. These belong to the division of Spanish sheep termed *stationary*, and are of the Chunab breed, entirely different and distinct from the merino. In fact they are their antipodes—being taller, larger, with heads smaller and free of wool. The staple of their wool, indeed, approaches very near to hair, being six or eight inches in length, almost devoid of curve, and consequently of very inferior quality. This breed of sheep exists along with the merino throughout the entire extent of Spain, but has never been introduced either into England or the United States, except as an object of curiosity. Being regarded by the committee in that light, and not as a breed profitable to be adopted, they do not recommend them as entitled to a premium. The owner, however, should have the thanks of the society for adding so much to the interest of the show.

The other lot of sheep (a buck and ten ewes) were presented by Jacob Farnum, of the same place. These ewes possessed no extraordinary merit; but Mr. Farnum had begun to show a disposition to improve in the selection of his buck. He was half South Down. We can tell Mr. Farnum that he would do a great deal better should he procure a full-blood South Down buck. Then probably most or all of his lambs would be as good as the buck he now has, while the get of his half-blood will be very uncertain in character. For this slight disposition to improve, and because your committee believe that the raising and keeping of sheep should be encouraged in this county, they recommend that the first premium of six dollars be awarded to Mr. Farnum.

Upon the subject of sheep husbandry, so far as our county is concerned, the committee feel bound to say a word. The first question to be answered is, whether the raising of sheep is profitable or not. If we theorize only upon the matter, we shall answer the question in the affirmative. Sheep demand less care than any of the domestic animals; and therefore less labor, in comparison, is needed for them than for any other stock. They are less dainty than any other animals—feeding, as experiments show, upon one hundred and more species of plants which cattle and horses refuse. They must, therefore, improve pastures by clearing away many foul and useless weeds and plants which cattle avoid. The tastes of men have changed somewhat; and the meat of sheep, whether lamb or mutton, is in much more demand than formerly. Their carcasses, therefore, must meet a ready sale at remunerating prices.

But why speculate upon a matter which is capable of proof? —and that, too, by the best evidence possible—the testimony of experience. This testimony is all one way, so far as the information of your committee extends; and that is, that sheep are very profitable animals in Essex County to the general farmer. Not only has this been the case since the demand for lamb and mutton has increased and the prices of wool have sometimes ranged high, but, taking all things into the account, it has *always* been true. A member of our Board of Trustees, lately deceased, whose opinions always received, as they deserved, great consideration, and were seldom found to be wrong, used to say that a pasture which would carry twenty head of full-grown cattle, and for which that number was sufficient, would carry twenty sheep besides, without detriment to the cattle, and with positive benefit to the pasture. However this may be, it is conceded on all hands that a small flock of sheep are as profitable as any stock a farmer can keep. Admit this to be so, and it is easy to make them far more profitable.

We have had heretofore, with very few exceptions, what are termed the old-fashioned breed of sheep—which is no breed at all, or rather a mongrel intermingling of several breeds, some with long wool, more with short wool, others between long and short, but all of them deficient in what is most and permanently profitable—to wit, weight of carcass. The raising of sheep for their *wool* mainly, or exclusively, must be left to districts of country where pasturage abounds, and which are remote from markets. With us the carcass is to be looked to rather than the fleece. This deficiency of carcass can be entirely remedied with very little trouble or expense. Sheep of improved breeds, introduced from England by men of ample means and enlarged views, have become so numerous that any farmer can improve his flock almost without money—certainly at a very moderate price. The Leicesters and South Downs, or grade animals largely impregnated with their respective blood, can be obtained any where, and any of them would give increased value to the progeny of our ordinary sheep. The Leicesters have long headed the list of English sheep; but recently either some of the less aristocratic families have stolen a march upon them, or the taste of John Bull has changed, for the mutton of the black-faced breeds is worth in Smithfield market a halfpenny per pound more than the Leicesters. We take it that the English are the best judges; and, following them, South Downs are to be recommended as more valuable to us here than Leicesters. They certainly are to be so recommended if the fashion of feeding, or more properly *starving*, sheep, hitherto often practised, is to be continued; for they have "a patience of occasional short keep, and an endurance of hard stocking, equal to any other sheep."

But the best sheep (in the opinion of those of your committee who have seen them) which have yet been introduced to the United States are those lately imported by Mr. Fay, of Lynn—a gentleman to whom our society, for his pecuniary liberality, is under many obligations, for the benefit of his suggestions, and examples, far more. After very particular and extensive observation of different breeds and different flocks of the same breed, Mr. Fay selected these as, in his opinion, the best English sheep to send to his farm in Essex County, both for profit and improvement. These sheep have been by him named "Oxfordshire Downs." They are cross bred between the Cotswold and pure South Down, inheriting from the former a carcass exceeding in weight that of the South Down from one-fifth to one-quarter, a fleece the fibre of which is somewhat coarser and stronger, it is true, but weightier than the South Down by one-third to one-half; from the latter the rotundity of form and fulness of muscle in the more valuable parts, with the brown face and leg, so that they may not be very inaptly termed South Downs *enlarged and improved.* We should suppose that the live weight of either of Mr. Fay's imported bucks would exceed two hundred pounds. The ewes are larger than pure South Down ewes in like proportion. We recommend to those farmers of the county who are interested in sheep-breeding to look at these sheep. The sight will well repay the expense of a visit from any part of the Commonwealth.

With these various and abundant materials for improvement within our reach, and with the certainty that the raising of sheep, even unimproved, is profitable, we must be blind to our interests not to take advantage of the opportunities within our reach. Hundreds of acres of pasture land in the county partially worn out, and full of shrubs which the cattle reject, may be improved by stocking with sheep. At the same time the animals themselves will probably pay a better profit than any other farm stock.

There are two ojections sometimes urged against the breeding of these useful animals. One is the risk of loss from dogs. We have not time to go into a dissertation on dogs. Those only are valuable which remain at home. From such, properly restrained, there is little danger. Roving dogs are dangerous and without value. To kill all such is doing injury to nobody, but rendering their owners and the public a positive service.

If farmers would act in concert in this matter the risk of loss from these nuisances would be very little, for the nuisances themselves would be soon abated. The other objection is insufficiency of fence. Formerly, when sheep in much larger numbers than at present were kept in the county, our fathers kept them within their own enclosures. It is but a poor commentary on this age of improved farming to say that we cannot keep in repair the fences which they built. And yet whoever travels over Essex County will be forced to admit its truth. If our pastures are not fenced so as to secure sheep, they ought to be. The improved breeds of sheep give us an advantage in this respect, too; for, being heavier than the old racers, they do not leap fences half so readily, and are, therefore, restrained with comparative ease.

Every farm is not adapted to sheep-breeding. Those best adapted to the purpose are where there is an extent of elevated pasture such as we see in all parts of the county, being overrun with moss and worthless bushes. The improvement of such would add much to the agricultural value of the county. In the opinion of your committee, the stocking of sheep would bring about this result.

In short, your committee recommend to every farmer, whose land is adapted to them, to make trial of a few sheep. Give them a fair chance in summer—bestow upon them moderate care at all seasons; but at yeaning time give them your undivided attention. Feed well afterwards, particularly if the lambs are dropped early in the year; and we think they will amply repay the pains and expense which may be bestowed upon them.

T. E. Payson, *Chairman.*

WORCESTER.

From the Report of the Committee.

The number and variety of this excellent and useful domestic animal on exhibition were too limited to warrant an occasion for boasting. It is hoped that the farming interest located in the heart of the Commonwealth will look to it that stock so susceptible of profit as an article of sale and of improvement to soil will no longer be so sparse on our hills and about our lawns, and that these peregrinating exterminators of ox-eye daisy and St. John'swort shall find a welcome admission on many of our degenerated pastures and fields.

These fleecy friends inhabit constantly the parks and lawns of the larger land proprietors of France, England and Germany, in close proximity to their residences. Why should we expatriate them to the prairies of Illinois and the pastures of the far West? And now that the prices of mutton and beef are assimilated, let the farmers of our county again try the experiment of raising sheep for the carcass as well as for the wool.

Submitted for the committee by

PETER T. HOMER, *Chairman.*

FRANKLIN.

Report of the Committee.

There were but twelve entries; not as many by far as there should have been, or as many as we hoped to see. We know there are many very fine flocks both of fine and coarse wool sheep in this county, and we regret that there were not more specimens presented for exhibition. Those that were entered, we are happy to say, were of very good quality, consisting of Silesians, Saxon, French and Spanish merino, South Downs, and mixed breeds.

A statement from Thomas J. Field, of Northfield, of a flock of three hundred and one fine wool sheep, shows the sale of wool and increase of flock to amount in one year to $1,026.55. Mr. Field also submitted a statement of sales of lambs from some lots of South Downs at five dollars each, and the wool, which averaged about four pounds.

It is readily seen that there is great profit in raising either of the above-mentioned breeds of sheep; and we wish the farmers of Franklin County would give more attention to them than they have heretofore. If there is profit in raising any kind of stock, (and we are sure there is,) it is raising a flock of *good*, not *ordinary*, sheep.

There were no entries either for the shambles or stall feeding. Of course we could award no premiums to those classes. We regret it; for we know there are many very fine sheep in our immediate vicinity which would have given a creditable representation for both the stall and the shambles.

CHARLES POMEROY, *Chairman.*

Statement of Thomas J. Field.

Flock March 1, 1853:—		
100 ewes,		$400 00
40 " old ones,		120 00
160 yearlings and two-year-olds,		400 00
1 buck,		80 00
		$1,000 00
Sold:—		
61 fat sheep for the market, after shearing,		186 00
50 old ewes, in October,		121 00
1,101 lbs. of wool,		605 55
		$912 55
Deducting cost of a cosset bought, that was sold with the 61,		10 00
		$902 55
March 1, 1854:—		
134 ewes,	$536 00	
38 fat sheep,	133 00	
142 yearlings and two-year-olds,	355 00	
3 bucks,	100 00—$1,124 00	
Cr. For increased value of flock,		124 00
Total,		$1,026 55

My increased value was mostly on account of my having no old ewes and from my fat wethers. Had the year been out in April after I had sold my fat sheep, instead of March, it would have given me $39 more gain on my flock.

SWINE.

ESSEX.

From the Report of the Committee.

The Committee on Swine regard the duty of awarding premiums upon the animals presented for their inspection as important, and requiring the closest and most candid attention; and they have endeavored to bestow such attention in the present case. This duty, however, may properly be considered as subordinate to the great matter constructively committed to them—viz., to aid in determining what breed of swine is best adapted to the County of Essex. And having disposed of the matter of premiums, the committee devoted as much time to the subject referred to as they were able to—without, however, arriving at any conclusion fully satisfactory to themselves. It is a great question, deserving the attention of every agricultural society; and we are happy to perceive it is receiving the attention it deserves.

It may be, and may remain, a general truth, that, in the language of the chairman of the Hampshire County Committee of last year, "no one breed is best adapted to all locations and circumstances." It can hardly be credited, however, for a moment, that the answers to inquiries of the United States Commissioner of Patents some two years ago, making a different and distinct breed necessary for almost every State, are to be taken as literally true. May it not be questioned whether there are as many distinct breeds of swine as is supposed? Might not a better knowledge of animal physiology aid us in accounting for the fact that different breeds of swine are so often recommended for the same or a neighboring locality? Or, to be more explicit, has it not often been found true, that of the same litter of pigs some die and some live, and of those that live a part shall do well and the rest shall not? And what butcher of swine is not familiar with the fact that the *post mortem* examination often reveals the diseased liver, with its large or small ulcers, or worms in the intestines, requiring a considerable part of the food taken by the animal for their support, or other diseased organs, not easily detected even when the animal is slaughtered, and almost always unsuspected till then? In short, may not adventitious circumstances have often, most undeservedly, given complexion to our ideas of the value of our breeds of swine?

If a distinguished theologian at the commencement of the present century could say, "It is for want of *information* that we see so many new things," may it not be for the same reason that such an otherwise unaccountable diversity of opinions on the subject of the breeds of our swine continues to prevail and to keep up the confusion? A good judge of stock it may be, and a known friend to its improvement, has a pure Suffolk hog that does not and will not thrive; and the same pen may contain an "old-fashioned" hog that does thrive. In this state of things he receives a circular from the Commissioner on Patents containing the usual inquiry, "What is the best breed of hogs?" He sits down and writes for answer just about what has developed itself in his own sty. This goes into the annual agricultural report of the department, and is thence sent out over the whole country. It is by no means intimated that this is always, or even often, the case; but when it is, of how much value is the document?

The following, from the Agriculture of Massachusetts for 1853, compiled by our indefatigable secretary, Mr. Flint, page 364, will show how little reliance can be placed upon opinions often formed and expressed upon this subject. The question put to gentlemen in different parts of the country contained in the United States Commissioner's circular was, "What is the best breed of hogs?" And, says the writer, "New Hampshire answers, 'The Suffolk;' Connecticut, 'A mixture of the old-fashioned hog with the Berkshire and the China breed does very well;' New York, by three of her citizens, separately, says, 'Berkshires and Leicesters;' New Jersey answers, 'A cross with the Berkshires;' Pennsylvania says, 'A cross of the Berkshires and Chester County;' Virginia says, 'Irish Grazier and mixed Berkshire are our common stock;' Georgia answers, 'The best breeds for the climate are the Woburn and Grazier;' Mississippi says, 'The best hogs I have tried are the Berkshires;' Texas, 'Irish Grazier;' Tennessee says, 'The common old Grazier mixed with the Hindoo breed.'" And, without following the language too literally, it may be added, that, while Kentucky is satisfied with the "Woburn" only, her more voracious neighbor, Ohio, must have the "Leicester," "Bedford," "Chinese," and the "Calcutta;" and while Missouri takes a cross of the "black Berkshire" and the "white Irish," Florida says, that, "for the range or shift-for-yourself system, the long-nosed Pike stands A No. 1."

And when it appears, as it does from the same source, that a hundred pounds of corn yield in some cases "but eight pounds of pork," and in others "forty pounds," it would seem that there must be something more than the peculiarities of breed to be taken into the account in explaining these results. Not indeed, let it be distinctly understood, that the accidents of diseased organs, &c., referred to, would account for all this variety of opinion, and least of all would we intimate that gentlemen answer the commissioner without suitable reflection; but, great as is the confusion and apparent number of breeds and the mixing up of breeds, there might be found to be less of both, we think, if the "accidents" were fewer, or if we were better able to detect them.

It is a fair question, and an important one to begin with, What and how many breeds of hogs are there really distinct? Some are so, clearly; but the question is not easily determined, and no discussion of it is proposed in this report. The generally received opinion is that the Suffolk is a distinct, original breed. Let it be so considered. Now, is it the best breed for general use in the county of Essex? *It is not*, even though it is true that the pork of this breed is much esteemed, and generally commands from one to two cents a pound extra in Boston market. The reason is obvious—they come to maturity at a very early age, and never, or rarely, weigh more than two hundred and fifty or three hundred pounds. There is a real difficulty in keeping them from taking on fat, it is said, in order to their getting any considerable growth at all. Dr. J. Kittredge informed the committee, while examining his pure Suffolk boars, that he could with difficulty keep them low enough in flesh to answer for breeders or to bring to the show. Their keeping had been one quart of meal a day, with the house slops, and raw apples, both sweet and sour; and upon this keeping they were fat, notwithstanding the large one had served for forty-two sows, and the small one for twenty or thirty, since last spring. It seems, therefore, now clear, that the Suffolks, being easy to fat, (indeed, being always fat, it is said, after being a month old,) are a suitable breed to cross with.

The only remaining difficulty is, to know and obtain the best breed for crossing with them. And, first, it should not be the Chinese, because they incline to fatten too much on the belly and too little on the back; and besides, according to Youatt, they are too oily, and do not make good bacon. Neither should they cross with either the Berkshire or Byfield, because both are too small and snug boned to make a large hog. But probably, to put a case within the reach of all, almost any of the large kind, the "old-fashioned kind," would make a good crossing with the Suffolk.

To be definite, however, the committee have been exceedingly pleased with the sow of Mr. Foster, of Andover, exhibited this year at Lawrence, and her four pigs. This sow is the result of the crossing with a pure Suffolk boar and a large breed of sows, called sometimes the Chester, and sometimes the Westchester, breed. The committee are unable to learn whether this last breed is common in our county. The mother of Mr. Foster's sow referred to was a large, long-sided animal, as we were informed, owned by a Mr. Kimball, of Bradford. One such case, of course, is not sufficient to determine a question of so much consequence; but if Mr. Kimball could be induced to keep his sow for breeding, and Dr. Kittredge his pure Suffolk boars for the same purpose, much would be done towards determining the matter. Nothing in the pens at our show could begin to compare with the sow of Mr. Foster referred to.

One fact, going to show the accidental differences in different animals of the same breed, has come under the notice of the committee, and goes to confirm the theory above suggested—viz., that hidden, occult causes may be at work on a part of the individuals of the same species, and not upon others. The Chester sow, mother of Mr. Foster's, above mentioned, was, as the committee were credibly informed, large, long, and rather coarse. But no sooner had we fixed in our minds the leading properties of the Chester sow than we met in the very next pen (Mr. I. Osgood Loring's) a Chester breeding sow, thirteen months old, with her four pigs, eleven weeks old. The sow, however, had no resemblance to the mother of Mr. Foster's as it had been described to us, being small and neat, and in many points resembling the Suffolk. If Mr. Loring's is a genuine Chester breed, then the mother of Mr. Foster's could not be; and, in any way, a crossing of the pure Suffolk and Mr. Loring's breed could not be recommended. Perhaps the committee erred in listening to any hearsay statements respecting the Chester sow of Mr. Kimball, (mother of Mr. Foster's,) especially to make use of knowledge so obtained as a basis for an opinion upon a question of this kind; but we could not resist the desire to know something more of the parentage of Mr. Foster's sow. Let those get a better crossing who can.

The large native sow of Jacob Farnham also attracted the favorable notice of the committee, and would no doubt make a good crossing with Dr. Kittredge's Suffolk boar. Such a crossing we would strongly recommend.

The committee can but admire the method of Dr. Kittredge—which is, to procure the best breeds within his reach, and to keep them for the public good.

As the "Agriculture of Massachusetts," by Mr. Flint, referred to in the early part of this report, is not likely to be seen by all who may see our County Society's Transactions, it may not be amiss to draw upon the Report of the Norfolk County Society's Committee on Swine for the last year in relation to one point. It is a report prepared with great care, and contains, moreover, a treatise upon swine, by Sanford Howard, of unusual value.

The point about to be mentioned, taken from the report referred to, is discussed by another writer. This writer starts the idea, and refers to "Giles, in Philosophical Transactions for 1821," as an authority for the theory, *that the male by whom the female is destined to receive her first progeny stamps a character upon every subsequent produce, even by other males!* As no facts are cited in support of this theory, it will be doubted by many, of course. If, however, it should have the effect of inducing those having valuable sows to be careful in selecting the boar to which the young sow shall go for the first time, the hint will not be lost. And to apply the rule in our county, it would seem a clear case, that if those having large-framed sows of any breed, and living within a reasonable distance of a pure-blooded Suffolk, would take the pains to carry them to such boars, they would be well compensated by the extra price they would obtain for their pigs, or by the quantity and quality of the pork, if they should keep them or sell them at market.

David Choate, *Chairman.*

HAMPDEN.

From the Report of the Committee.

In discharging the duties assigned us, your committee are aware of the prejudice in many minds in favor of different breeds of swine; yet, conceding to every breed its just merit, and to every man's opinion all that is due, we claim for ourselves no exemption from like preferences. Our prejudice, however, instead of favoring any particular one, is against all swinish breeds as food for man, especially in consequence of its known injurious effects upon scrofulous systems. With this frank and respectful deference to the judgment of all who may differ from us, the society, we trust, will bear with us in the free expression of our own belief. While we are compelled from necessity to decide against the use of pork as a prominent article of food for ourselves, we are quite ready to waive our private opinion for the gratification of those who can use it with apparent impunity, because we know it to be for our pecuniary interest as farmers to keep and deal in swine. Hence our position will favorably aid us in drawing an impartial portraiture of character.

The hog is reputedly a dirty, loathsome, greedy animal; though often made so, not by choice, but by the manner in which he is kept. He is often reared, too, simply because it can be done so cheaply. Being a voracious animal, he greedily devours bugs, worms and carrion, and is turned off with the trash from orchard and garden, with the refuse scraps of the kitchen, the sweepings of the barn, and offal of the market. Absorbing such ingredients, it is by no means a wonder that his flesh is rejected by Grahamite epicures. His organs of digestion are powerful; and to the extent and perfection of these, and of his respiratory powers, he is indebted for his loathsome voraciousness. And may not his filthy habits be in a great measure accounted for from the fact that his sense of touch is so very acute, rendering heat extremely oppressive, and the least contact from insects equally annoying—thus inducing a resort to water for the purpose of cooling himself, and to a coat of mud for self-protection? Adapting himself to every variety of climate, being in this respect a perfect cosmopolite, a citizen at large, coming to maturity early, and being easily improved by the breeder, he is more quickly rendered suitable to the purposes required than any other description of live stock. From no other source can the poor man so readily supply his table with meat; and no branch of farm husbandry pays so well for the required care and attention as the raising and fattening of swine for the market. Young porklings are always lively, happy, and full of innocent sport; and in their little domestic arrangements each chooses his teat, and ever after retains possession of it, the compact (which is always more faithfully maintained than in the human family) providing that every one shall keep on his own territory, without abrogation or compromise—a regimen under which they attain about as high a scale of mutual courtesy and regard as do some of the human race; for, with the latter, might too often makes right. Such, briefly, is the minority of porkdom; but the exact period at which a pig becomes of age, or, in other words, a hog, has never been decided; though from early infancy his hoggish propensities, like those of some persons we wot of, are considerably developed.

According to medical men, scrofula means "little pig;" and it is well known that pork is difficult of digestion, and liable to produce cutaneous diseases, especially in scrofulous systems, and persons thus circumstanced crave it continually. Pork was much used by the Jews; yet they seemed to understand its effect upon the system; for, by the stringent laws of Moses, it was strictly forbidden in cases of leprosy—that being a disease of the skin. Some have considered it more healthy to eat pork in winter than in summer, in cold climates than in warm; and there is a reason for it. Physicians say that the constant use of pork in warm weather tends to produce bilious complaints; but in cold weather the system requires more carbon than in warm, in order to keep up the proper degree of animal heat; and oily substances of every description contain a large proportion of carbon, as do wood, charcoal, and other combustible materials. The union of carbon and oxygen creates heat; and it matters not whether that union is conducted in the fireplace and lampwick, or in the lungs of animals or human beings. In either case the action (the union of the carbon, in the wood, oil and blood, with the oxygen of the air) and the result (the production of heat) are one and the same. Hence the Esquimaux quaffs his liquid whale oil with apparent gusto; his system requires it, and his lamp of life will not continue to burn without it. And like the lampwick, which is so saturated with oil that it will flicker and soon be extinguished, is the man who, in warm climates or in warm weather, loads his stomach with greasy pork, that will either not digest, producing dyspepsia, or, if digesting, will so overcharge the blood with carbon that the oxygen of the air in the lungs cannot in any manner unite with it. Hence it is that impurities inevitably collect in the lungs, causing consumption, while the blood is returned to the system in an impure state, producing diseases of all kinds. Thus much of medical comment.

If swine are allowed to feed on grass, without much other nutriment, the effect of constantly reaching down is to lengthen the snout; and following the law of habit, by which a limb is increased in length and strength in proportion as it is exercised, Lamarck, an infidel philosopher, would seem to have had some slight foundation for his theory of the development of creation, according to which man was first a clam, and, after passing through different grades of improvement, emerged at last from the monkey and orang outang into a full-grown specimen of humanity; and the elephant, which was first a mouse, transmigrated through successive generations, and finally assumed the form of a hog, from which, with his tusks and snout lengthened by continually feeding on herbs, and his size increased by favorable climate and luxuriant living, he has now become an elephantine monster! In a wild state the hog has been known to live thirty years; but in domesticated existence he is usually killed at two years of age. In referring to history, we find the wild boar was a very common inhabitant of the forest in the British isles previous to the civil wars. From him probably all the different varieties now in those islands have originated. The principal English breeds have been named after the counties in which they have been chiefly raised, as the Berkshire, Essex, Suffolk, &c. The Chinese and improved Suffolk are best adapted for table pork; the Norfolk and some others, among them those which we call natives, are more suited for bacon.

The improved Suffolk originated in a cross of the Chinese and Berkshire with the old Suffolk—a large-boned, long-eared, coarse hog; the cross with the Berkshire having hair, and that with the Chinese having comparatively none. The improved Suffolk are often rejected because judged of by the old breed, (as are the improved Devonshire cattle;) while their good qualities are overlooked, or not acknowledged, by persons thus prejudiced. There is perhaps no better breed than the Suffolk for our New England farmers. Animals from this stock are well formed, compact, prolific, and very hardy. They are easily kept in fine condition, and fatten readily while young. If they attain less size and weight than other breeds, they also consume less food. It is a question, whether the amount of food required to make five hundred pounds of pork in a large hog would, if fed to two Suffolks, make as much or more in weight. The experiment could easily be tried; and would it not be well for our agricultural societies to encourage such experiments, not only with the different breeds of swine, but with all other stock, especially cattle? It is also a question, to be answered by experiment, whether more beef cannot be made from Devons by the use of a certain amount of food than from any other breed. And the same proposition applies with equal pertinence to the rearing of Suffolk pigs.

The consumption of pork in the United States far exceeds that of any other country, to say nothing of the large amounts exported—a fact which has, and should in future, stimulate much attention to the improvement of swine. In 1840, the number of swine in the United States was 26,300,000. Tennessee had more than any other State, her number being over 2,900,000; Ohio had over 2,000,000; New York over 1,900,000; and all the New England States combined only 850,000. In 1850, there were 30,315,700 swine in the United States. Tennessee had over 3,100,000; Kentucky over 2,800,000, standing second on the list; Ohio and New York had not increased; and the New England States had decreased, and probably stand now in the same proportion. Taking the average at $10 per head, the value of the hogs in the United States would be $303,157,000—certainly an item of sufficient importance to encourage increased enterprise and effort among growers of this class of stock.

In awarding premiums on this occasion, we have estimated the combined qualities of the several animals presented, the various breeds having distinct points adapting them to different uses and for different markets; and where these were all embraced in one class, the committee found it no ordinary task to arrive at just conclusions. Aware that persons entertaining diverse opinions and prejudices, as in times past, would perhaps have decided differently, we feel relieved from exposure to any just accusation of partiality. What we have accomplished we have done with the best intentions to serve the society and promote the interests of agriculture.

H. M. Sessions, *Chairman.*

NORFOLK.

From the Report of the Committee.

The display of swine at the Norfolk Agricultural Fair was one of the finest ever seen in Massachusetts. The attention of farmers in Norfolk County seems to have been especially directed to the subject of swine. The Suffolk breed, in particular, is regarded with much enthusiasm.

The First Annual Report of the Secretary of the Board of Agriculture of Massachusetts, 1854, says, page 93, "We see that the Suffolk, or rather a cross of the Suffolk with some other breed, holds the highest place in public estimation in all parts of the State."

It is claimed, and coincides with the views of your committee, that, in point of economy, this breed of hogs is much easier kept, and takes on fat faster, and at less expense, than any other known. There is much less waste in cutting up for the barrel; the pork is sweeter and more delicate. They are docile, thrifty, and mature early, weighing, at from twelve to eighteen months, from two hundred to four hundred and fifty pounds, and occasionally as high as five hundred. The extent to which these weighty considerations have a bearing upon the Massachusetts farmers cannot be better conveyed than by instancing the fact that the committee saw a few days since, at the farm of Dr. Morton, in West Needham, a pair of pure Suffolks, imported from the yard of Prince Albert for the sole purpose of getting a different strain of blood into his herd of Suffolks, which have already carried more prizes from the Norfolk County Show than any others in it, and from which a boar and a sow each took your Society's first premium at their last exhibition.

The profit in raising swine by the New England farmer is not in the breed alone; there should be warm, comfortable piggeries, with conveniences for manufacturing manure. This is one of the largest sources of profit, and one which is entirely lost sight of by many.

Hiram W. Jones, *Chairman.*

FEEDING STOCK.

ESSEX.

From the Report of the Committee.

We regret to say that, at our late annual fair, the results of no experiments, successful or unsuccessful, were presented for your committee's consideration. But we should regret still more to think that this fact is an indication of the real interest which the farmers of Essex County feel on the subject, and to be forced to believe that the matter is at rest. We apprehend that this subject is of vital importance where good beef and pork are spoken of as being plenty or scarce and at high or low prices; but how the prime or indifferent article gets there is another question, with which few are disposed to trouble themselves, except they are engaged in the business. As, however, our best cattle and swine do not "rain down" nor run wild in the forest, there is need of expending a portion of our time and capital for the supply of our markets with these staple products, that the business may be a remunerative one to the producer.

And here we need the light of experience other than that which has yet been gained. What is requisite is, that we possess a knowledge of carefully-conducted experiments respecting the laws of nutrition, health, and the best process of fattening animals whose flesh is so nutritious. For it is well known that long practice may of itself only confirm wrong views and habits; and it is evident that for some reason there is a deficiency, both in quantity and quality, in the cattle and swine now furnished for our market. Complaints are every where rife on this subject. There are many whose powers of mastication groan under the attempt to subsist on tough beef and Western pork. We believe that there are evils somewhere, which need to be sought out and remedied. Those of us who were not born Grahamites are well persuaded that there is a reason for the difference between the hale, hearty, jovial look of the farmers of Essex County, and the lean, lank visage of those of some of the other occupations. Our farmers have Yankee enough in them to know what good meat is, and ability sufficient to make use of such for their tables.

But the question recurs, What is to be done in order to make the best of beef and pork abundant? We say that, first of all, there must be sought out by *experiment,* and then carefully practised, better and cheaper modes for fattening animals. We believe the thing is feasible—that proper effort in this direction will be successful. We would at present only *hint* at the subject. The question is not so much how we may fatten our best breeds of cattle or the young and most thriving animals,—though in regard even to these great improvement may doubtless be made,—but the chief difficulty lies in fattening better and cheaper our oxen that have been inured to hard labor, and our cows that have become too old to become profitable in the dairy. It is desirable that the farmer should have the profit and the honor of selling them for first-class beef, and that the consumer should have the comfort of eating the same.

We have no doubt that proper trial can show how this can be done. For example: Our aged cow, whose appearance indicates that she was fit for little else than "crow-bait," has been taken about the first of May, and in the course of a month, by bleeding, nursing and careful feeding, put in a thriving condition. In another month she was made fair-looking beef, and before the month of September was sold for a good article. If beef that is speedily fattened is better, and if our ordinary grass-fed cattle could be prepared for market in one-half the usual time by daily additional feeding with meal during the summer months, there would evidently be a good gain to the farmer.

Another important question pertaining to this subject is the fattening of swine. We believe that, aside from a careful selection of the best breeds, attention should here be chiefly directed to three points—the health, the comfort and the disposition of the animal. Much has been said about warm and convenient pens, cleanliness, ventilation, &c., which needs to be put in practice. We should like to have set before us a series of more careful experiments in the regular feeding of swine than have yet been made. We believe important knowledge may be elicited, by experiments in feeding the uneasy and troublesome that are to be fattened, by feeding them regularly four times a day instead of three—the usual method. Respecting the disposition of the animals we would only now say, that the feeder must carefully study the habits and character of each. Let the turbulent be provided with a quiet resting-place, the quarrelsome be separated from each other, and let the excessively greedy have the temptation of a competitor in eating removed out of sight. On these and numerous other points we want careful and protracted experiments by our intelligent and enterprising farmers. We hope that another year will find some of them ready to receive, not only the liberal premium offered by the society, but the thanks of the community, for their efforts.

M. G. J. Emery, *Chairman.*

POULTRY.

ESSEX.

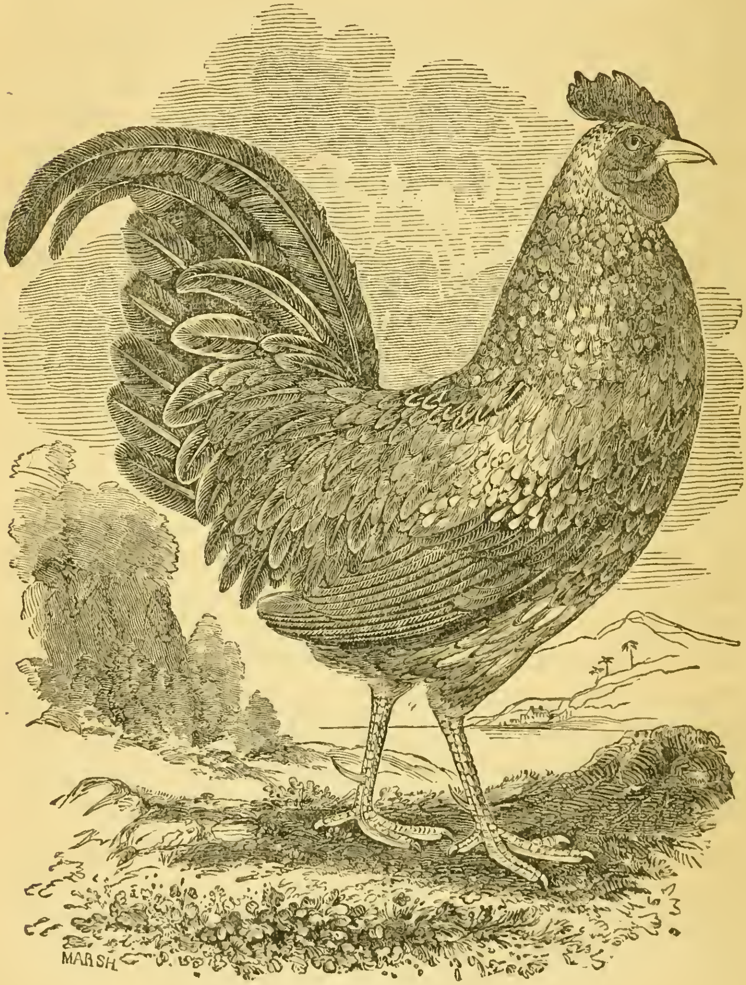
Report of the Committee.

The Committee on Poultry, having attended to the duties assigned to them, and having had their eyes carefully cocked over a considerable collection of closely-caged and cooped, clawed and calcarated, captives, clamorously crowing, cackling and clucking, candidates of scratching, corn-catching, cockscombical, cockadoodledoodom, continually calling on the committee for conscientious consideration, feel spurred to concoct the following report:—

They found upon the field of display, and upon a range of platforms, running, to the best of their judgment, in a line from N. N. W. to S. S. E., and in plain view of the "proud bird of America," (whose gilded wooden

——"eyes were open, though their sense was shut,"—*Macbeth*,)

perched on the summit of the tower of the City Hall of Lawrence, a goodly variety of coops and cages, some prepared with taste and judgment, and some with no taste nor judgment at all, and containing a varied collection and some excellent specimens of the gallinaceous race, as well as some rather-ish indifferent samples thereof; so that, in the words of the immortal Shakspeare, by the mouth of Macbeth to Banquo, they might say,—



WILD COCK OF INDIA.

> "So fair and foul (fowl) a 'show' we have not seen."

Having made their tour of inspection along the whole line of coops, penetrating with no little difficulty the dense mass which thronged around admiring the committee, (N. B.—The comma after "committee" should be after "admiring!") unanimously agreed to recommend that a premium be awarded to S. Southwick, of Danvers, for his seven well-prepared coops of excellent fowls, containing specimens, "in good order and well conditioned," of Brahmapootras, Red Shanghaes, Black Spanish, and Black Bantams, White Poland ducks and China ducks, all in first-rate keeping, and fully justifying the wish of the committee that they could be present with sharp teeth and sharper appetite, and, hearing what Byron calls

"the all-soft'ning, overpowering knell,
The tocsin of the soul—the *dinner-bell*,"

sit down at the "festive board," with

"clang of plates, of knife and fork,
And merciless fall, like tomahawk to work,"—*Peter Pindar*,

on just such samples, "done brown on both sides"—claws uppermost, and bellies all dilate with a spicy compound of bread and sweet marjoram. Your committee, believing themselves fully adequate to such an occasion, would do the feast as ample justice as did the Trojans in Italy when their ravenous appetite carried them to such an extreme that their youthful leader, Ascanius, exclaimed,—

"Heus, etiam mensas consumimus."—*Virgil.*

Which one of your committee, an old pedagogue, interprets to mean,—

"Halloo, my lads! your appetites, so rare,
Bolt meats and bread, nor e'en the tables spare."

Also to Charles Barker, of Andover, a premium for his half-breed wild geese. These were as splendid birds as ever

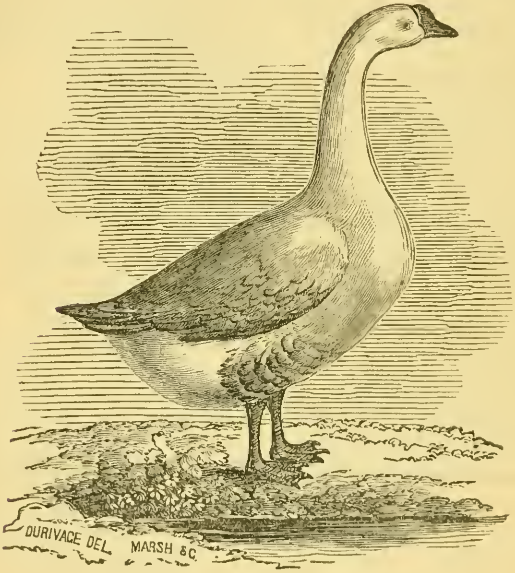
"gabbled o'er the pool,
When noisy children are let loose from school."
—*Goldsmith transposed.*

And, besides that, were beautiful and touching illustrations of the omnipotent tyranny of love over the wildest wanderers of wild-goosedom.

> "Quis enim modus adsit amori?"—*Virgil.*

"What limit to the power of love?" Shakspeare says,—

> "It may transform a man into an oyster."


DURIVACE DEL.
MARSH SC.

What man or gander can oppose a breast adamantine enough to stop a single bolt from Cupid's bow? Your committee, in their day, have had experience of some pretty tough samples of goose-breast, but none whose

> "tough, impracticable heart,
> Was proof against great Cupid's dart."—*Old Poem.*

These birds, too, proved conclusively that Tom Moore had more poetry than truth in his noddle when he sang,—

> "The bird let loose in Eastern skies,
> When hastening fondly home,
> Ne'er stoops to earth his wing, nor flies
> Where idle warblers roam."

Since here, "visible to the naked eye," was a slap-in-the-mouth contradiction thereof; for

> "from his aerial career,
> A monarch of goosedom, stern, long-necked and high,—*Street varied*,

allured by the siren hiss and quack of some seductive voice, sweetly sibillating, in dulcet notes,—

> "O goosey, goosey gander,
> Whither do you wander?"

stoops down to earth and

> "Stamps an image of himself,
> A sovereign of a frog pond."—*Dryden varied.*

But our love-striken gander was not without high precedent and classic example in his amorous dallying with a daughter of earth. Great Jove, the Thunderer, himself, the Greek mythologists tell us, assumed the shape of a swan, and descended to earth to greet fair Leda,

> "Sparta's beauteous queen."

Hear what poor old Jack Falstaff says, in the "Merry Wives of Windsor:"—

> "O powerful love! You once, O Jupiter, were a swan for the love of Leda! O omnipotent love! How near the god drew to the complexion of a goose! Think on't, O Jove! a fault in the semblance of a fowl! a foul fault!"

Now, every schoolboy, not wholly oblivious of his Horace, knows that this same Leda, after this visit, laid a couple of splendid eggs, from which were hatched those splendid fellows, Castor and Pollux, redoubtable knock-down heroes in their time, and now fixed in constellation among the starry host. And if these things were so, (and who dare say they were not, against the august authority of Hesiod and Homer, and Horace and Ovid, and Jack Falstaff,) who can blame an honest, simple-hearted gander for taking the great god for a leader, when the great god himself had a Leda (leader?) of his own following?

But, leaving the delightful and seductive fields of classic lore, let us proceed with our report.

To E. G. Berry, of North Danvers, for his bantam hen, with her *three broods of chickens, all of the present "year of grace"* 1854, she having hatched no fewer than twenty-six chicks at her three several settings. Now, here is a bantam "as is a bantam," an example to all clucking hendom for persistent practice in the vocation whereunto she was born. Surely, if the younglings had been asked, "Does your mother know you are out?" they must have given a negative reply; for what mother's memory could be equal to knowing it of such a multitude?

To E. C. Bartlett, of Lawrence, for his bantam cock, accompanied by eight chicks, which said tender and chicken-hearted cock cared for, brooded over, fed, nursed and reared, when forsaken by their unnaturally cruel mother, who had scarcely "found them out" of the shell when she forsook them to the cold charity of an unfeeling world. And yet in justice to her it must be said, that, if cold in her affections, she was warm in her ovarium; since, immediately on hatching and deserting her brood, she returned to her nest and became fertilely parturient and oviparous. Instances of this paternal maternity are not uncommon in the gallinaceous race. In the July number of the "Cottage Gardener," (1854,) an excellent work, published in London, mention is made of a brooding Shanghae cock which took charge of a brood of chicks whose mother left them at a fortnight old. In the August number of the same work two young cockerels are noticed, which were brooding Dorking, Chittiprat, Spanish and Cochin chickens, from three weeks to two months old. And in the September number a correspondent speaks of a white Shanghae cock, to whose care some chicks were delivered as an experiment, and who clucked and called and scratched for and fed them with the greatest care, carrying them on his back and comforting them in every possible way by day, and at night brooding them under his wings. The reverse of this, in the crowing of hens, is also not uncommon. The writer remembers one among some hens kept in Boston by his father. So then we have cock-hens and hen-cocks; and Nature is not always true to herself; though that is her affair, and not ours; and if she chooses to let the hen occasionally "wear the breeches" and crow, and

> "Mothers monsters prove,"

and if she permits the cock to become tender-hearted, and warm-breasted, and philoprogenitive, and a nursing father, gentle as a "sucking dove," the committee have nothing to say against it.

We say nothing of the practical good to be derived from an extensive cultivation of fancy birds of any sort; yet, as a pleasant accompaniment about the house and barn, equally interesting to the "old folks at home" and to the "bonnie bairns" about the homestead, nothing surpasses the race of the Columbidæ; and they have been kept and cosseted in all time, and consecrated as emblems of innocence, harmlessness and peace, disposed to "rough and tumble" only in their name. They are almost sacred birds, and seem to have been so regarded from the earliest antiquity. Noah, after his forty days' wandering upon a "sea without a shore," where

> "Angels did tire their wings, but found no spot whereon to rest,"—*Byron*,

felt his first flush of hope when his returning dove brought the olive token in its mouth. So, too, throughout the records of the first dispensation, we find them chosen offerings in the temple services of the Jews; and in the second, and perfected, and crowning dispensation of God to man, the dove was the sacred emblem of the Holy Spirit, resting upon the well-beloved Son when

> "O'er his head, that humbly bent,
> The Baptist poured the wave."—*Fletcher*.

Equally, too, was it held in veneration by the Gentile nations; and the poetry of Greece and Rome is filled with allusions to the dove, and always, as in the sacred writings, as emblematic of affection, innocence, and love.

Glorious old Virgil, who, in the midst of a corrupt, and debauched, and licentious age, wrote not a line "which, dying, he could wish to blot," and whose poetry we put, without hesitation, into the hands of our children at school, has made frequent allusions to the dove, and always in a delightful way. Who can forget what Melibœus says to Tityrus?—

Here shall the pruner sing his merry lay
While 'mid the vines he toils the livelong day;
Here, too, the dove his tender mate shall woo,
Nor, from the elm, the turtle cease to coo.

Ecl. I. 57—60. *Done into English by the Committee!*

And again:—

A gift I've found for her my soul loves best,
Where the wild pigeon builds her lofty nest.

Ecl. III. 68, 69. *Do. by the Committee!*

So, too, jolly old Anacreon, whose poety we commend as poetry, but whose moral influence was decidedly vinous and villanous, says, in his exquisite "Ode to the Dove," (done so well into English by Tom Moore that the committee venture not upon it,)

"Tell me, whither, sweetest dove,
Tell me, whither do you rove?
Shedding through the air, in showers,
Essence of the balmiest flowers."

And so in numberless other quotations might we show how great a favorite in all time this charming tenant of the wood, the field and the homestead, has continued to be. But, commending its culture as a source of innocent amusement, we pass on.

There were mingled amongst the birds of which we have spoken some animals which the committee thought a little out of place, since, from the fact of their having four legs instead of two, they were not supposed to be legitimate ornithological specimens. These were rabbits, Guinea pigs, *et id omne genus*—that is, "all that sort of thing." Especially was there a bicipitous abomination, a

"Monstrum informe, ingens, with a head twice as big as it should be,

Virgil varied,

or rather with two heads instead of one, rivalling in ugliness that usurping King of England, wicked Richard III., who confessed himself not to be

"—— shaped for sportive tricks,
Nor made to court an amorous looking-glass;
Cheated of feature by dissembling Nature;
So lame and so unfashionable
That dogs do bark at me."—*Shakspeare.*

The committee passed it by in unutterable loathing and disgust, expressing their decided and unanimous conviction that such bestialities as two-headed, and six-legged, and double-tailed calves, centaurs and cerberuses, multicipital serpents, Joice Heths and woolly horses, should be frowned down by a discerning indignant public sentiment, or turned over to Barnum.

> "Hence! of blackest midnight born,
> In Stygian cave forlorn,
> 'Midst horrid shapes, and shrieks, and sights unholy—
> Hence! and in dark Cimmerian desert ever dwell."—*Milton.*

Your committee cannot refrain from expressing their great regret that no specimens of the native farm-yard fowl were present at the exhibition. Every thing offered was of the fancy stock, a good deal of which stock is "far-fetched and dear-bought," and not worth the inflated prices which are asked, and not unfrequently paid, for it. Some bold-spoken proverbialist has put forth a saying, that has more truth than beauty in it, about "a fool and his money," &c. Perhaps this is carrying the reproach a little too far; though occasionally an energetic medicine may be needed to cure a violent and obstinate fault. Now, it is well known that, in these latter times, there have been paid to fancy fowl breeders as high as $25, $35, and even $50 the pair for birds of foreign stock. At a sale in England in April last, six Shanghae chickens, three months old, brought $55; a lemon-colored hen brought $77; a lemon-colored cock brought $135; and a buff cock, called "Nelson," weighing thirteen pounds, brought $215, and after the sale a nobleman offered $250 for him! A Spanish hen brought $55, and a cock brought $60. At this sale one hundred and eighty-two lots of birds were sold, and the sales amounted to $3,872.50! Should any incredulous Sadducees think that your committee are "drawing the longbow" in these statements, and taxing the credulity of those who may read them a little too heavily, they are referred to the "Cottage Gardener" for April, 1854, whence the above prices were copied. One would half suppose that some of the hen-excited fanciers would, as "honest Iago" said,

> "Drown themselves for the love of a Guinea hen."—*Shakspeare.*

Certainly, before they attended the sale, they had greatly needed to have taken the same worthy gentleman's advice to Roderigo, wherein he often counselled,—

> "Put *money* in thy purse, I say—put *money* in thy purse."—*Shakspeare.*

But such prices are an unnatural inflation, and must collapse. Who can possibly imagine that a Shanghae cock, or any other biddy in all cockdom, is intrinsically worth $250? "Thou torturest me, good Tubal," said Shylock; "it was my turkois. I would not have given it for a whole wilderness of monkeys." But fancy and fashion both run into wild extremes; and, as long as purchasers will pay such prices, there will never be wanting sellers who will be willing and even glad to accommodate them.

For ourselves, we do not believe that the fancy poultry introduced within the last ten years is so vastly superior to the native stock when well cared for. The truth is, that when a man has, at a great expense, bought a flock of these high-priced birds, he cannot afford to neglect them as he may, and almost always does, neglect the common fowls of the dunghill. He bestows extra pains upon them. He gives them better shelter and better food, and better results are the natural and obvious consequence; and then, "behold! he boasteth great things" of his fancy stock. Yet we venture the assertion, that, were better food and shelter given to the native birds, they might be improved to the extent of giving as favorable results, both in flesh and eggs, as any foreign stock ever imported. We do not mean to disparage the latter; there are many excellent varieties and beautiful birds among them; and, to our thinking, none are before the Black Spanish, the English Dorkings and the Bolton Grays, of all which three varieties we had capital samples at our fair. These are all good layers, naturally healthy, of tender, and juicy, and sweet flesh, and a valuable acquisition. Cocks of these varieties introduced among the common fowls of the farm yard would greatly improve the stock. Indeed, a crossing between any foreign cock and the Barn Door (that is, the fowl, so called, not the door—"the thing of life," not the thing of hinges) is manifestly much better than in-and-in-breeding. In fact, it is this continual in-and-in-breeding that has caused the common fowl to deteriorate; and in this view the efforts of the fowl fancier are of great merit, because he provides the means of improving the ordinary stock; and all attempts to establish good breeds, at once hardy, white fleshed, quickly fattened, and steady and abundant layers, are entitled to praise. Yet our taste would hardly lead us to discard the old stocks wholly and substitute the new. Especially would we not give them up for any of those huge, awkward, ungainly, cowardly, gormandizing and insatiate gluttons of the Chittagong, Shanghae, Brahmapootra, Cochin and Malay races.

Were they cocks of these hideous breeds that were consecrated to Mars, Apollo and Mercury? Was it their doleful groan that presaged the victory of Themistocles over the Persians? Was it a short-winged cock of these breeds that flew up to the maintopsail yard of the ship of the gallant Macdonough, and there crowed with lusty lung and clarion voice, during the fury of the fight on Lake Champlain? No, no; it is your good old clear-toned, gallant Greek, and English cock that has the mettle for such daring. Why, there is but small courage or pluck in them, and no comeliness either before or behind, especially the latter. Their gait is awkward, and shuffling, and laborious, and they waddle like an over-fat drake, yet with none of his small grace of motion. Neither is there a cock among the whole of them that knows how to crow as a "cock of the walk" ought to crow.

Whenever he attempts it your ears are regaled with a doleful, long-drawled, lugubrious, droning cadence, compound of the tones of a cracked Chinese gong, a stuck calf, a battered fish horn, and the dismal "childish treble" of an old singer's fading bass, with a penny whistle wind-up at the end thereof. The very attitude in which he crows shows that the effort distresses him, from the tip of his beak to the end of all the tail he has, and that tail "no great shakes" after all. Compared with this, how carols to the morn the old English

"cock's shrill clarion" (*Gray's Elegy*)

of which wrote Shakspeare!—

"Hark! hark! I hear
The strain of chanticleer!"

And again:—

> "The cock, that is the trumpet of the morn,
> Doth with his lofty and shrill-sounding throat
> Awake the god of day."—*Hamlet.*

No, no; the cock of English song,—

> "The cock that doth crow
> To let you know,
> If you are wise,
> 'Tis time to rise,"—*Old Primer,*

is the chap that Dryden describes, whose

> "Comb was high and coral red withal,
> In dents embattled, like a castle wall;
> His bill was raven black, and shone like jet;
> Blue were his legs, andorient were his feet;
> White were his nails, like silver to behold;
> His body glittering like the burnished gold."

We like to see a cock of that high tone and lofty bearing; and many such a one have we seen about the farm houses of the county, strutting through the barn yard, uxoriously clucking, and calling to choice tidbits his whole harem of wives, polygamous Turk as he is—feathering with drooping wing, fondling over them as they coyly resist, and cooing about them so daintily and proudly that his legs seem to scorn, *in toto,* the dusty soil beneath his toes.

The committee, in conclusion, earnestly recommend to the farmers of the county to give greater heed to the improvement of their poultry. The birds of the barn yard are a mixed-up race; and though, in some instances, large and handsome birds may be found, such as those kept by Mr. Frost, of North Andover, yet too often they are small and inferior. Mr. Frost's fowls are large and well proportioned-birds, the cocks being particularly handsome; and this superiority has been attained by care in the breeding and keeping of them. They are supposed to be the native bird, improved by care in the management; yet their size and color, and the complexion of the shell of their eggs, seem to indicate the presence of foreign blood. They are a good sample of what may be accomplished by the right course of treatment. No fowls can thrive, nor do themselves justice in meeting the intention of their being kept, unless some small thought and care in providing be had for them. In summer they need a good range, a chance for scratching and burying themselves in the warm sand; and, in winter, warm and comfortable shelter from the cold and snow. Nothing is so baneful to them as cold and wet; and no creatures more quickly and certainly show the good effects of proper protection, comfortable housing, and good food. Yes,—

When the winds whistle cold,
And the stars glimmer red;
When the flocks are in fold,
And the cattle in shed;
When the hoar-frost is chill
Upon moorland and hill;
When the wintry blasts blow
O'er the wild-drifting snow,—

then shelter, comfort, and protect the poor biddies, and let not

"——the winds of heaven
Visit their face too roughly."—*Hamlet.*

Give them a warm nook, warm food, and enough of it, clean water, dry sand to wallow in, and lime cleanings to pick amongst, that they may not lack the raw material for the eggshell. An occasional chance at raw meat is very good for them; and if you will roast the refuse bones from the kitchen, and crush them, and mix with them meal dough, it will prove a highly acceptable tidbit for them. They will amply repay your care, in being in better health, better flesh, and better able to stand the cold of our severe winter, and they will earlier begin and later continue their laying of eggs. Introduce to your stock, if they be native birds, a cock of some of the best approved foreign varieties, and fancy runs towards the Dorking and Spanish more particularly; though, if aiming at increased size, you may look to some one of the East India monsters. At any rate, do the very best you can with the breed you may happen to have, and do the best you can to improve the quality of that breed. To be sure, as Virgil (whom we like to quote) says of the culture of bees,—

"In tenui labor, at tenuis non gloria, si quem
Numina læva sinunt, auditque vocatus Apollo."

Which our aforesaid committee-man, the old pedagogue, interprets to mean,—

> "A toil on trifles; yet no trifling gains,
> If Heaven assist and Phœbus help our pains."

In conclusion, your committee recommend an entire change in the method of premiums in this department of the society's exhibition. At present the money awarded is in the shape of gratuities rather than of distinct premiums; and we advise that it should take the form of the latter, and that distinct sums should be awarded for the best and second-best specimens of distinct varieties, and that special pains should be taken to bring out the best possible specimens of the native stocks, and specimens of that stock crossed on some of the foreign and fancy stocks. We certainly think that this course, if adopted, will be productive of good results.

The committee here close; although their report has by no means exhausted the fertile subject which they have discussed. What they have written, and a great deal more that they might have written, both original and *in the way of quotation*, is most respectfully submitted.

Henry K. Oliver, *Chairman.*

MIDDLESEX.

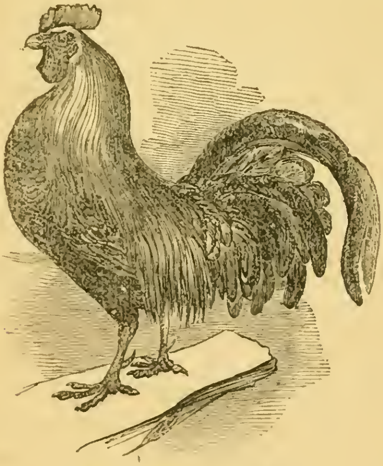
Statement of James A. Barrett.

The fowls which I offer for premium are a part of my flock, consisting of one hundred and two in number, with which I began the year. They have been fed upon different kinds of grain and a plenty of oyster shells, earthen and some animal matter. I have at the present time about forty-one old fowls on hand, and have averaged about seventy-four. They have lain four hundred and seventy-eight dozen of eggs; and the receipts and expenses for nine months, since the first of January, have been as follows:—

Expenditures:—		
One hundred and two fowls on hand January 1, at 62½ cents,	$63 75	
Cost of keeping,	85 84	
		$149 59
Receipts:—		
Received for eggs, poultry, &c.,	$124 44	
Thirty-seven hens on hand, at 62½ cents,	23 12	
Fifty chickens, at 62½ cents,	31 25	
Guano sufficient to manure seven acres of corn in the hill,	25 00	
		203 81
		149 59
		$54 22

Which is a little more than eighty-five per cent. on the first cost.

CONCORD, October, 1854.



ENGLISH GAME.

MIDDLESEX SOUTH.

From the Report of the Committee.

When the "hen fever" was at its height it was an easy matter to write a report on fowls. The chief requisites were, to describe and recommend some new variety or varieties, monstrous in size, and prolific of eggs, with an outlandish name, and the public ear and mouth were open. The more extravagant the statements respecting size and productiveness, and the less said about cost of keeping, and fineness of flesh, and hardiness to endure our climate, the better.

But with people in general this day is past. Our common-sense farmers, and indeed men of every calling who take an interest in this business, have become cautious and incredulous. Perhaps prejudice against the larger and rarer varieties is now tending to a hurtful extreme; but in time this matter will regulate itself.

No one can deny that the efforts made within the past few years, by gentlemen of means and taste, to import and breed foreign stock, and even the lavish and often profitless expenditures of the mere amateur, have been productive of great good. Some really excellent varieties have been introduced; and the public attention has been awakened, and careful investigation made, till now the principles of successful breeding are well understood. The old proverb, "Don't reckon your chickens before they are hatched," is now effectually repealed; and the experienced breeder can calculate on the number and the profits of increase with as much certainty as the breeder of Jersey cattle or Suffolk swine.

The same general principles apply to poultry breeding as to the rearing of stock of any class. Skill in selecting perfect birds, a dry, warm shelter, and an airy range, suited to the nature of the fowl, regular feeding, and a variety of food, are some of the indispensable requisites to success. A damp, cold nest or roost will ruin the best fowl, in spite of good feeding; and irregular feeding will counteract the advantage of a good shelter.

The skilful poulterer will adapt his choice of kinds and his feeding to the end he has in view. If rearing for the table, he will look for plump bodies, fine-grained and flavored flesh, and early maturity, and will give hearty food, and keep his fowls quiet. If rearing for eggs, he will choose the kind which lays the largest number of rich, heavy eggs, and has least tendency to set, and will feed on stimulating food, and give his fowls abundant scratching room.

The different grains are to be chiefly depended on for food for fowls; certain proportions of raw vegetables and animal food are also necessary. In summer, if allowed a free range, they will obtain sufficient quantities of both the latter. In winter, the hen especially requires a regular portion of raw vegetables. Late-cut rowen hay is probably the best and cheapest article of this kind for hens. They eat it greedily, and will need no other.

Fowls of all kinds should be under the charge of one and the same keeper, with whom they may become acquainted. They soon learn his looks, and ways, and calls, and when to expect food, and are not disturbed when he enters the yard or house. The feeling of security and quiet thus insured has much to do with the prosperity of the flock. Equally essential is it that the keeper should understand the peculiar nature and habits of the fowl he tends. Their natural mode of nesting, the first indications of a desire to set, their habits of perching and sleeping, and the various symptoms of disease to which they are subject, are points of seemingly trivial consequence, yet essential. Ignorance on such points is a prominent cause of the failure of so many poultry experiments.

J. H. TEMPLE, *for the Committee.*

HAMPSHIRE.

Report of the Committee.

The question, whether the farmer can afford to spend much time or money in this department, is one which is not very definitely settled. That it is a very comfortable matter to have a generous number of eggs and fat chickens and turkeys during the year, and especially about Thanksgiving time, is a point about which there is probably very little dispute; but when we come to the question, whether, in view of the dollars and cents, we can actually *afford* to have them, the subject seems at present to be an open one.

That there is as much pleasure to be derived from the prosecution of labor in this department as from any other connected with the farm, we believe to be susceptible of abundant proof. Indeed, what can be more beautiful than a flock of fowls, where every tint and shade of color are presented in the very perfection of beauty to the eye of the beholder? And yet this perfection, with comparatively little care in "crossing," is easily obtained. Again: what farmer would be willing to dispense with the call of the noble "farm cock" at the earliest dawn of each returning day? Or who can be insensible to the value of a flock of fowls in destroying worms and insects, which otherwise might exert a very deleterious influence on the growing crop?

One of the competitors at the fair remarked to the committee, that, in his opinion, (and he has devoted as much time to this subject as any man in this vicinity,) "the good thus accomplished would more than compensate for the damage which they would naturally do to the crops, either in the garden or upon the farm."

But is there an actual profit in raising poultry? We are constrained to answer this question in the affirmative; and, in confirmation of our views, we wish to introduce some statistics, very kindly furnished by Mr. L. P. Warner, of Sunderland, showing the value of his flock of hens during the past year.

On the 1st of January, 1853, Mr. Warner valued his stock of hens at $23.25, and at the close of the year at $24. He thinks the average number through the year would be about sixty. His largest number of laying hens at any one time was seventy-five. The largest number of eggs in any one day was seventy.

To these hens he fed, during the year, food worth $39.45, consisting of corn, potatoes, meat and bone meal. The whole number of eggs produced was five thousand four hundred and fifty-one, which were sold for $60.79. The receipts for poultry sold were $30.28, amounting to $91.07. If from this sum we subtract the whole expense for feed, we have in round numbers $51.62 as the clear profit on the $23.25—the capital invested. We are aware that we have not estimated the interest; neither have we spoken of the item of manure, which must have been an important one, and, if added to the seventy-five cents in our favor at the close of the year, would pay the interest on the capital invested, and swell the amount of clear profit very considerably.

We perhaps ought, also, to state that the expense of the outfit was next to nothing.

In view of facts like the above, we feel ourselves justified in calling the attention of farmers to the importance of giving more attention to this subject. It must be apparent to every one that the profit, in proportion to the amount invested by Mr. Warner, was enormous. Whether others would be alike successful, experiment alone can determine.

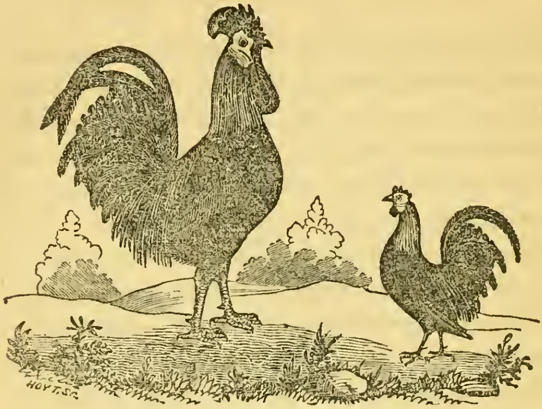
N. G. Trow, *Chairman.*

BERKSHIRE.

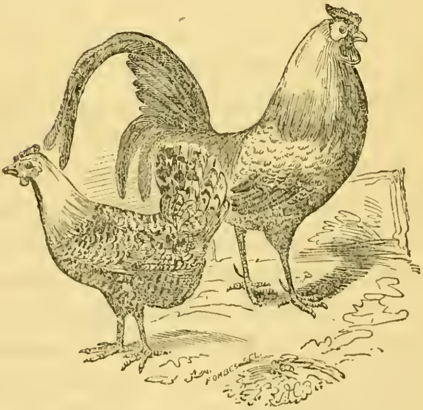
From the Report of the Committee.

A farm yard without poultry is like an unfurnished house. The great variety of purposes to which domestic fowls may be applied, in their contributions to the table, is well known to all.

There have been introduced into this county several valuable foreign varieties. Among them are the Chinese fowls—which, however, are not esteemed quite so much upon trial as they were upon their first appearance. They have good points, and, with some, retain their estimation; but other breeds are more popular at present. The trim and beautiful Bolton Grays are esteemed the most industrious layers, but, from their want of size, are not so good for the table. The silver pheasants are showy and splendid fowls, but serve rather as ornaments of the farm yard than for any other purpose, not being remarkable as layers nor as fowls for the table. The Golden Hamburgs are very beautiful—better for eating than the Bolton Grays, and by many considered nearly as good for laying. Upon the whole, the committee are of opinion that there should be in every farm yard a number of pure-blooded Bolton Grays for laying, together with our native breeds, which are much better for hatching and rearing than any of the new varieties.



BLACK SPANISH.



BOLTON GRAYS.

James D. Colt, 2d, *Chairman.*

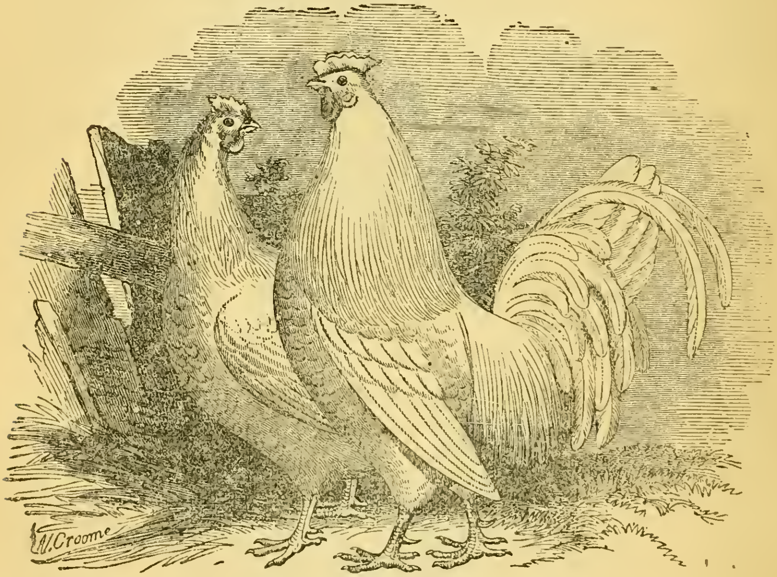
BRISTOL.

From the Report of the Committee.

Although poultry has for very many years been considered a favorite and delicate article of food, it is only within a comparatively short time that the attention of agriculturists has been turned to the introduction of new breeds of domestic fowls, or to the improvement of those already well known. But, of late years, the subject of raising poultry has received much attention; the number of breeds has been largely increased; and it is now generally understood that the poultry yard, properly and judiciously managed, will contribute its full proportion to the profits of the farmer; while, as a branch of rural economy, it is exceeded in the interest and pleasure derived from it by no other pursuit peculiar to his occupation. The statistics on this subject are probably far from perfect; but enough is known, not only to surprise those who have paid no attention to it, but to show clearly that the value of the poultry stock in the United States is no small item of the national wealth. The whole value of the poultry in the United States at the present time cannot be less than twenty millions of dollars, and the amount would probably exceed this sum. That of the State of New York alone, in the year 1840, was over two millions of dollars, and was greater than the entire value of the sheep raised in the same State in that year, and nearly five times the value of the horses and mules raised within her borders. It is estimated that the city of New York alone expends nearly a million and a half of dollars annually in the purchase of eggs. The estimates of the value of the poultry in the country are taken from the United States census for the year 1840, and are perhaps to be almost doubled to give the correct result at the present time.

Since that time several choice foreign breeds have been introduced, and an impetus has been given to this interesting branch of agriculture, which had before been almost wholly neglected. Conventions of the feathered tribes have been held, at which were assembled together specimens of what our grandfathers would with difficulty recognize as belonging to the *hen* family; and strange noises were heard at these assemblages, not such as were emitted from the throats of the cocks who awakened them from their slumbers at early dawn.

But the "hen fever," as it has been deridingly termed, is now subsiding, yet not without having produced beneficial results. From the various breeds which curiosity or ambition has brought among us our farmers have had an opportunity of selecting those which are best adapted to our climate and most profitable—those which lay eggs most abundantly, and those whose flesh is the best for the table.



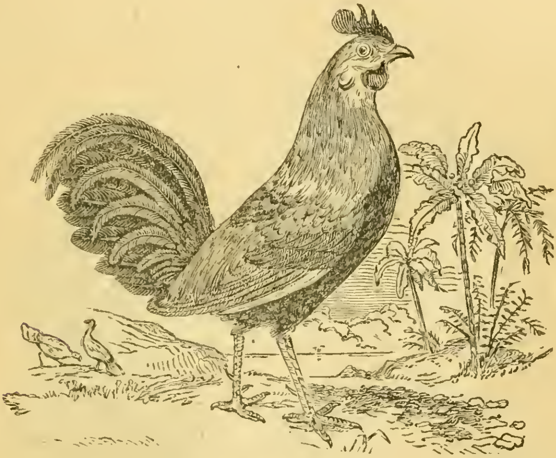
DORKINGS.

Your committee were highly pleased with the number, the choice varieties, and the beauty of the fowls presented at the fair. They are satisfied that the farmers of Bristol County are fully aware of the importance of this branch of agriculture, and that they yield to none in the attention and care they bestow upon it.

H. B. WETHERELL.

Statement of Robert Mansfield.

I send you the following statement of the income from five fowls the present season. There was a daily memorandum kept of eggs laid, of the time of three of the hens' setting, the number of chickens raised, &c. My fowls were not entered for premium; but this statement is submitted for publication, if worthy. I believe the equal to the production of these fowls has never been published. They have averaged more than three eggs in four days to each hen when not setting or going with the chickens. Here is the result:—



GALLUS BANKIVA.

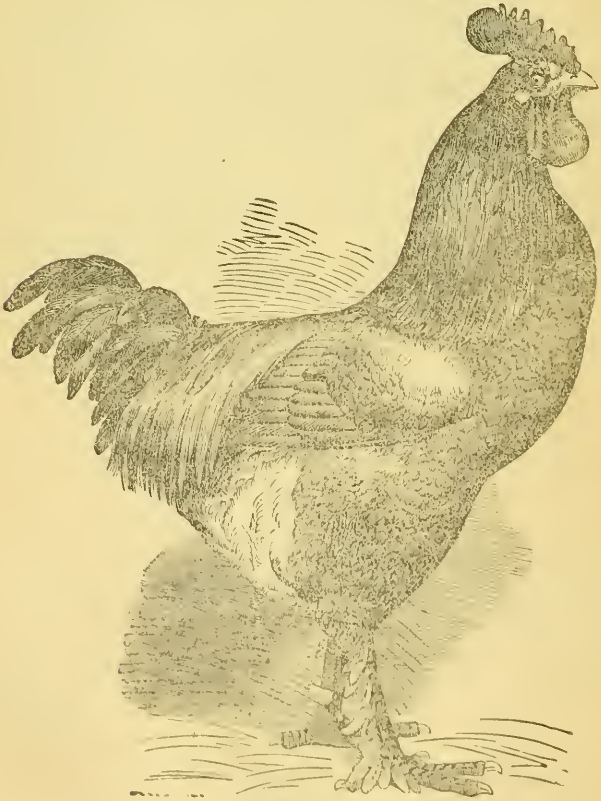
March 28, 1854.

To one rooster, half game, half native, . .	$0 50
To four hens, half Spanish, half Poland, .	2 00
To four dozen eggs to set, ...	72
To five bushels corn, ...	5 00
	$8 22

Credit.

By 441 eggs,	$6 61
By one rooster, used at home,	50
By two chickens used,	80
By eight chickens,	3 20
By sixteen chickens,	3 20
By four hens, at 50 cents,	2 00
	$16 31
	8 22
	$8 09

This account commenced the 28th of March, 1854, and closed the 26th of September, 1854.



SHANGHAE.

BEES.

NORFOLK.

Report of the Committee.

Owing to the want of a premium, or some other cause, there was a great apathy among bee owners in presenting any thing for our consideration. And yet, agriculturally, pomologically, scientifically, or *sigh*chologically considered, we might suppose many would *wax* warm upon the subject. The raising of buckwheat or white clover in preference to other grains or other grasses may depend on the prior question, whether one intends to keep bees or not; and this gives the subject its *agricultural* aspect.

The raising of thin-skinned peaches and juicy pears, in preference to such as are woolly as serge or have a skin like the rhinoceros, may depend on whether one keeps bees or not; and that gives it the *pomological* aspect. The *cell*ular membrane of a hive, for the secretion of honey, gives it the *scientific* aspect; and the looking for a heavy produce in the cells, and discovering simply the depredations of the bee moth, presents the *sigh*chological aspect—not to mention certain regrets incident to an awkward handling of the insects. A full and candid treatise on the bee is a desideratum yet. We want to know *all* the facts. Our friend Dr. Eddy has not discussed the subject in reference to the injury of fruit, on which the public mind is distressingly divided. It has been declared bees *will not* injure fruit; and we verily believe they will not injure the shagbark nor the watermelon any more than they would hurt a horseshoe or a gutta percha walking stick. But if the fellows will not revel in a Bolmar, Washington plum or a Bartlett pear, then our eyes and ears, and fingers too, have deceived us. We might as well say (some of us think) that a cow will not meddle with vegetables in the garden because she does not graze tomato plants, or that a yeoman does not like fruit because he refuses olives, as that a bee does *no* mischief because it does not do every conceivable kind of mischief on every conceivable kind of fruit.

But we are not writing a prize essay, and therefore return to the exhibition itself, to express our opinion of what we saw in your exhibition hall.

We saw Dr. Eddy's Protective Bee Hive, and Dr. Eddy himself, and Mr. W. S. Damrell's bees in the hive, and some beautiful drawers of honey, belonging either to the bees or Mr. Damrell, as sound ethics may determine. We heard the statements of the doctor concerning the hive, and are prepared conscientiously to say that we believe he has accomplished a work in which all others have failed—that of protecting the bee from the moth. No intelligent miller would attempt an invasion. Every joint is secured; or if by inadvertence one little crevice is exposed, he could penetrate no farther than a Jew can penetrate the Mosque of Omar. He might perchance *smell* the honey; but to reach it is a stubborn impossibility. Furthermore, the doctor has provided for a most judicious ventilation, which, equalizing the temperature of the hive, is well adapted to preserve the operatives in an amiable spirit and excite them to an exemplary diligence—two objects to be attained in respect to other hives.

We think Mr. Damrell's bees did creditably and profitably, and presented an interesting feature of your exhibition; and we think also that the whole subject of raising honey is yet open to discussion, experiment, and the establishing of facts. We have not altered, however, but rather cling more tenaciously to, our opinion, that ambitious fruit growers may observe caution in regard to the bee enterprise.

We make these strictures, however, as applicable to Norfolk County, and those around Boston particularly, and not applicable to our central or western counties.

The bee loves the clover field (the white clover) as the humming bird loves the honeysuckle, and will forsake many a fruit and many a flower for a sip out of the chalice of the clover. It loves also the buckwheat; and, when the field is fair and beautiful with its blossoms, your ear may catch the constant hum of the bee in drowsy sweetness, lulling the senses into quietude and peace. Raise your honey where the clover and the buckwheat fields abound, and it will have amber clearness, and save your Bolmars, your Gages, your Bartletts, and your patience.

For the Committee,

L. B. Babcock, *Chairman.*

Dedham, October 6, 1854.

PRODUCTS OF THE DAIRY.

ESSEX.

From the Report of the Committee.

The committee have been unable to make any award of the society's very attractive premiums offered in the third and fourth articles under the head of Dairy, as no competitors appeared for them. This is greatly to be regretted. The objects aimed at in these articles are among the most desirable that can be attained on a farm, viz.: 1st. How to produce the greatest quantity of milk from a given number of cows at the least expense; and, 2d. How to produce the greatest quantity of butter from the least amount of milk. There are a great many interesting points of information connected with these two questions. There are doubtless great differences existing in the degree of intelligence and success attained on different farms in this matter. If, by drawing the attention of our farmers to the subject, competition for the premiums could be excited at future fairs, very valuable information might be elicited, and a wholesome emulation arise which would lead to very happy results in dairy management.

The committee would cordially recommend to the milk farmers to attend to this subject. The greatest difficulty which stands in the way of improvement in this, as in other branches of agriculture, is the reluctance on the part of the farmers to keeping a set of farm accounts. It would require but a few minutes each day to make the necessary entries. Each cow should be named or numbered, her milk measured, and the corresponding entry made in the book daily, together from time to time with the manner and expense of feeding. Thus a complete history of the animal would be had, which would enable the farmer to judge accurately of his progress and success.

On the subject of butter, it is to be regretted that such great amounts of an inferior quality should continue year after year to be produced and thrown upon the market. Butter-making is a delicate art, it is true; but, when once understood, it requires very little, if any, more labor or expense to produce a good than a poor article. The good butter always commands a ready sale, while the poor is poor indeed. Why should not our farmers take a similar pride, and show as general a skill, in producing a good article from the raw material in this branch of their art as that evinced by mechanics in the various products of their labor? The farmer can no more expect a handsome result by careless and slipshod management than the carpenter, shoemaker, or hatter; and the one should be quite as much ashamed of inferiority as the others.

To ascertain what is the best management of dairy farms is a very interesting question. Amidst our numerous growing cities and towns, and in the dense population of old Essex, it will not do for the farmer to go listlessly along in old beaten tracks. Study and inquiry are necessary. New circumstances require new measures; and the farmers of our neighborhood who the most intelligently inquire after, and earliest obtain the products best adapted to the wants of our community, can inevitably reap a rich harvest from their proximity to our ready markets. The products of good farming, especially of the dairy, probably secure better prices than any other branch of common industry.

CHARLES H. BIGELOW, *Chairman.*

Statement of Charles P. Preston.

I offer for premium one box of September butter, containing fifteen pounds, being a sample of eight hundred and thirty-eight pounds; to which I will add two hundred and twenty-four pounds which could have been made from one thousand seven hundred and ninety-one quarts of milk otherwise disposed of—making ten hundred and sixty-two pounds, from an average number of eleven cows, between May 25 and September 25 of the present year.

The cows have been kept after the usual manner—viz., common pasture feed till August 1; afterwards corn fodder in addition.

Process of Making.—The milk is strained into tin pans in a cool cellar, where it remains from thirty-six to forty-eight hours, when the cream is taken off and kept cool until it is churned, which is twice a week, in order to have it as sweet as possible. The cream is churned in the "same old churn," without the addition of a "thermometer," having ascertained by experience that the temperature of sixty-two degrees is not the proper temperature in the summer months, but that the cream should be rendered as cold as it can be made in the coldest cellar before churning, in order to have the butter of a proper degree of hardness. It is well, however, in the spring or late autumn months, to dip a common thermometer in the cream and bring it to sixty or sixty-four degrees of temperature.

After churning the butter is thoroughly worked by hand, salted with from three-quarters to an ounce of salt to the pound, and passed through the mould for market.

North Danvers, September 25, 1854.

Statement of Elijah Pope.

I present for examination two pots of June butter, being a sample of one hundred and twelve pounds made between the 2d of June and 9th of July; and fifteen pounds of September butter, being a sample of three hundred and ninety-one pounds made between the 2d of June and 25th of September, made from four cows, besides six hundred and twenty-four quarts of milk used and sold.

Process of Making.—The milk is strained into tin pans. It stands about forty-eight hours, when the cream is taken off, put into tin pails, and stirred every day. During the warmest weather the cream is placed in the well about twelve hours before churning. We churn once a week. The buttermilk is thoroughly worked out, and the butter is salted with about one ounce to the pound.

The cows have had common pasture feed till August 1; since then corn fodder once a day.

DANVERS, September 26, 1854.

Statement of Mary Ann Ordway.

I present for examination a jar of September butter, containing eighteen pounds, being a sample of two hundred and six pounds, made from the milk of two cows from the 15th of May to the 18th of the present month. We have used what milk we wanted, averaging about three quarts a day. The cows have had common pasture feed only until the middle of August; since that time they have been fed once a day either with apples or corn fodder.

Process of Making.—The milk is strained into tin pans and placed in a cellar; the cream is taken off into stone jars when changed a little, and stirred daily. During the warmest weather the cream is set in cold water about twenty-four hours before churning. We churn once a week. As soon as the butter comes the buttermilk is worked out with the hands, and the butter salted with about one ounce and a quarter of salt to a pound, varying in some measure according to the state of the butter. After standing about twenty-four hours it is again worked over, and is fit for use.

WEST NEWBURY, September 28, 1854.

HAMPSHIRE.

From the Report of the Committee.

Believing that among so many specimens there must be some nearly perfect, we agreed upon certain qualities which should be indispensable to insure the award of a prize for butter.

The first requisite should be cleanliness. This is necessary through the whole process, from the milking of the cow to the finishing stroke of the butter paddle. Any suspicion of unfaithfulness here cloys the appetite at once, and makes one perfectly willing to eat his bread alone, rather than entertain a doubt whether he is taking into his mouth what properly belongs to the barn yard or the scavenger.

Closely connected with this is the absence of all foreign taste in butter. Many housewives, who perhaps are not justly chargeable with want of neatness, suffer this important article of manufacture to go from under their hands sadly intermixed with substances entirely foreign to the pure article. Salt is one of these; and, though necessary in certain proportions, it will hardly do to adopt the principle in regard to its use, that there cannot be too much of a good thing. We believe that one grand defect here is, that cream is kept too long, especially in the summer season, before it is churned. Few are aware, perhaps, how soon putrefaction takes place in milk in the hottest weather in summer. Undoubtedly the most satisfactory results are obtained where the churning is performed every day. This is not practicable in many of our small dairies; but, where a tolerable article is expected, it should be done as often as two or three times a week. Butter seems to possess, in a remarkable degree, the power of appropriating to itself the flavor of substances with which it is in near contact. One of your committee, anxious to protect his butter from the fine dust which is apt to settle upon it while on exhibition, procured a box, which was to be covered with glass. The box, for want of other material, was made of some sort of pine wood. In order to test the matter, and ascertain whether the butter would take any taste from the wood, a small lump was put upon a plate and placed in the box. In twelve hours it had imbibed so much of the flavor of the wood as to become strong and acrid even to the taste. In the examination made by the committee to-day the importance of this matter was amply illustrated—much too large a proportion of the lots exhibited having a taint of some foreign substance. While on this point it may be well to say that the quality of cream is sometimes materially damaged by being kept in a close vessel. This is probably in consequence of the confinement of certain gases, which operate injuriously, and which would escape if there were opportunity. Another of our requisites is color and density. The color, common consent declares, should be yellow; and it is useless to argue the question why it is so. It is granted that this is not a matter wholly within the dairywoman's power; but then, if she has a husband, and knows how to manage *him*, she may not find it so very difficult to induce him to make a trial of his cows, and keep only such as shall, by the aid of her facile hands, crown his board with a production as pleasing to the eye as it is tempting to the appetite.

T. G. Huntington, *Chairman.*

FRUITS.

ESSEX.

From the Report of the Committee.

Considering the extreme heat of the past summer, with the drought of August, causing so many trees to shed their fruit prematurely, your committee were apprehensive that the show would come short of previous exhibitions of this society. They were, however, agreeably disappointed in finding the quantity and quality of the fruit, on the whole, superior to any previous year—there being upon the tables one thousand and thirty-eight dishes and baskets from one hundred and thirty contributors. The apples were particularly fine, and less wormy than in former warm and moist seasons, which give rise to myriads of those minute foes, from the caterpillar to the almost invisible fly of every genus. We were pleased with the number of dishes of grapes shown, and trust that we may yet succeed in producing a hardy variety answering the conditions required in the offer for a seedling grape, as we have already done in the plum which took the first premium in a neighboring State.

The variation in size and appearance of the same varieties of apples and pears from different localities in the county demonstrates the necessity of ascertaining the conditions of our several soils. The Williams' Favorite and the Pickman apples cannot be well grown but upon a strong retentive soil, as also the Lewis and Wilkinson pears.

In regard to fruit for market culture, we would suggest the importance of raising winter varieties in preference to fall and summer fruits. Fall apples, ripening at the time of our best pears and peaches, must necessarily have a limited sale. This is well shown in the Gravenstein, which is one of our best apples; but ripening as it does at the time of the Bartlett and other fine pears, as well as the Crawford peaches, the demand for it is small. As to the best winter apples for Essex County culture, it may be considered, as we think, a fixed fact, with but two or three exceptions, that by far the greater number of fine winter apples which are considered the best for our culture are those which have originated on the soil of New England—the Nonesuch, from Hubbardston; the Mother, from Bolton; Baldwin, Roxbury Russet, Rhode Island Greening, Danvers Winter Sweet, Haskell's fine Sweet, Minister, and the Murphy. These are all such as we would commend for general culture. Of the finest winter pears, we should enumerate for table fruit the Winter Nelis, Lawrence, and Lewis; and for cooking, "Vicar of Wakefield," Black Pear of Worcester, Pound, and Catillac. For peaches, Crawford's Early and Late Melacoton, and the Red-Cheek Melacoton.

There seems to be an increasing desire among many of our farmers to grow the best varieties of apples; and we trust the time is not distant when our fine New England apples shall take the place of old varieties, such as the York Russet, (called Cat Head,) the Blue Pearmain, and other indifferent winter apples.

Although fruit is not absolutely indispensable to the support of human existence, it is a useful and wholesome article of food, and should be ranked among the best gifts of Providence. Mr. Knight has well observed, that the "palate which relishes fruit is seldom pleased with strong fermented liquors. Good fruit, therefore, operates favorably both on the physical and moral health of the people," and it is quite as easy to cultivate the best kinds as those of an inferior quality. Among the fruits exhibited at this show were the finest specimens of large sweet apples that we have been accustomed to see. One from Hiram Webster, of Salem, N. H., marked Pumpkin Sweet, was very fine. There were three distinct varieties marked "Pumpkin Sweet." We have not as yet been able to identify the true Pumpkin Sweet from the above sorts. These were severally from Georgetown, Beverly, and Newburyport.

From the limited time your committee had for their examination, and the opening of the hall for visitors before they had finished their preliminary business, they cannot be expected to have performed their duty in the most satisfactory manner—at least to themselves. Still, among the varieties of fruit upon the tables they noticed fine Hubbardston Nonesuch apples from Moses Newell, T. S. Carlton, E. G. Jackman, and C. F. Putnam; superior Roxbury Russets from various towns; peaches of seven varieties (a large collection) from Harrison Eaton, of Haverhill. These Merrimack River peaches were of the high New Jersey flavor, as we have always found this fruit grown around the Merrimack.

In the presentation of fruits, and particularly pears, it has been usual to exhibit those varieties which are described in foreign catalogues as "desirable," (but when received and tested on our soils are found worthless, or nearly so,) in order that individuals may have an opportunity to see for themselves, and thus avoid the trouble and expense of importing them. But we apprehend that it is no longer desirable to offer such varieties, year after year, after they have been proved and rejected.

JOHN M. IVES, *Chairman.*

Report of the Committee on New Fruits.

The only fruits submitted to the committee for premium were two seedling grapes from James Blood, of Newburyport, These same grapes were offered for premium last year, when an account of them, as received from Mr. Blood, was submitted to the trustees of the society in the report of the committee of that year, and is now repeated. Mr. Blood states, "These two specimens of grapes were raised from the seed of Malaga raisins, and cultivated in the open air, and ripened by the last of August. The vines have been in bearing nine years, and have never failed to produce a good crop in the natural soil without any nursing, such as bone manure, guano, &c. Their great recommendation is, that they ripen four or five weeks earlier than the Isabella. Slips from these vines have proved as productive in Vermont and New Hampshire, and ripen as early, as in the county of Essex." The two specimens were entered by Mr. Blood for the two premiums offered by the society. At the request of Mr. Blood, your committee visited his garden September 7, when they were told by him that he considered his grapes ripe; and subsequently, on September 15, they received from him specimens of the fruit.

The committee found the vines from which the grapes offered for premium were produced growing in a sheltered situation on a trellis in the garden of Mr. Blood. The vines did not appear to have received any particular cultivation; and Mr. Blood stated that the only manure applied to them was that received from a slight mulching of their roots. There was a good crop of fruit upon the vines. It did not appear to your committee, at the time of their visit on September 7, that the grapes were fully ripe; although in that opinion they differed from Mr. Blood, and in which they were subsequently confirmed by tasting the grapes September 15, when they had acquired additional sweetness and flavor. Your committee feel that implicit confidence is to be given to the statements of Mr. Blood in every respect; and they do not intend to be understood as questioning his account of the origin of these grapes by imputing to him a possibility of error, when they state, as they feel constrained to do, that every thing about his vines, both the fruit and the foliage,—an unerring indication,—tended to prove that they were, let their origin be what it might, of the same species as the native grape of our woods. And this, so far from deteriorating from their value, rather serves to enhance it; for seedling grapes of any of the foreign varieties, though they may for a time do well in certain situations, are so subject to mildew as to be, let their quality be what it may, entirely worthless for general cultivation.

The grapes of Mr. Blood are, as he states, much earlier in ripening than the Isabella, as is evidenced by comparing them with those of that variety grown under similar circumstances. Your committee found in the garden of Mr. Blood an Isabella grape vine growing in a situation not more unfavorable to the ripening of its fruit than that occupied by his seedlings; but of that the fruit was quite green when the fruit on the seedlings was ripe, or nearly so—thus affording a satisfactory proof of their earliness of ripening as compared with the Isabella; although, in a far less degree, the seedlings of Mr. Blood have the same pulpiness that distinguishes our native grapes, the correction of which is so desirable and so essential to entitle a grape to the character of great excellence.

Mr. Blood's grapes, when thoroughly ripe, or as ripe as the specimens presented on September 15, were juicy, sweet, and pleasant, but lacked sprightliness and flavor. In forming an opinion of their quality, your committee adopted as a standard the Isabella; and with fruit of this variety, of which ripe branches were obtained from vines growing in a situation favorable to their early ripening, a comparison was made, the result of which was not favorable to Mr. Blood's seedlings.

The premiums offered by the society are "for a new variety of native or seedling grapes, of decidedly superior quality, ripening in this county, in the open air, by the middle of September, prolific and suitable for the table—the same to be tested by the committee two years." It seems to be evidently the object of the society to endeavor to obtain from seed a grape superior to any now possessed, and that to none other would the award of premium so large in amount be justifiable. Independently of the requirements of the society, a due regard for the public should deter the committee from the award of any premium when that award might give rise to subsequent disappointment.

The seedling grapes of Mr. Blood have been tested two years in succession, as required by the society; and, so far as earliness is concerned, they seem to comply with that one of its conditions which requires that the grape, to be entitled to the premium, should ripen in the open air by the middle of September; but they do not, in the opinion of your committee, possess that other equally essential and perhaps more important requisite, of being of a "decidedly superior quality," without which no grape can come within the rule by which your committee are restricted in making their awards.

In the opinion of Mr. Blood, his seedlings were not ripe so early this season as usual, owing to the backwardness of the spring, and he thinks also that their quality was injured by the severe drought of the past season; but, making all due allowance for these unfavorable circumstances, your committee believe that, while Mr. Blood is entitled to the merit of having produced from seed grapes that are a very decided improvement on the native grape of the county, such do not excel, or even equal, some already in general cultivation, as the Isabella or Diana, to say nothing of some other seedlings of recent origin not yet so generally known.

Entertaining these opinions with respect to the grapes of Mr. Blood, and no other competitor having appeared for the premiums offered for grapes or other seedling fruits, the Committee on the Introduction of New Fruits have made no award of the premiums placed by the society at their disposal.

JOSEPH S. CABOT, *Chairman.*

HAMPDEN.

Report of the Committee.

It affords the committee pleasure to see so good a display of fruits upon the society's tables, especially as fears had been expressed that the recent hot and dry season would prove unfavorable to the fruit crop.

The drought undoubtedly impaired the size of the fruit and caused it to drop from the trees prematurely; but, on the whole, that exhibited was fair and of good size.

Although there was a large number of varieties of the pear, yet these were contributed by half a dozen individuals. This delicious fruit should be more generally cultivated than it now is. The fact that the raising of pears has required more care and attention than that of apples has deterred many from undertaking their culture. It is certain that the pear will not grow by merely putting the tree into the ground and leaving it to take care of itself. A knowledge of the kind of soil best suited to its culture must first be had, then care in planting, and afterwards such attention as will insure a healthy growth of the tree, and the cultivator will be most fully rewarded for all his trouble.

The person who raises good winter apples may be sure of a good market and a profitable return. The demand for apples that will keep well will undoubtedly increase at home; while new inducements to enterprise constantly present themselves in the increasing demand for exportation for foreign supply. We say, then, to the farmers of Hampden County, exclude from your premises the worthless varieties that take up the room which by right belongs to their "betters," and raise none but those kinds which will command a fair and remunerating price in the market.

Above all, take care of your orchards and fruit yards, and do not suffer them to "go to grass" or become covered with moss, but bestow upon them the same care that you do upon your Indian corn and other crops of less value. A little attention every year will give you fine healthy trees, with smooth bark, free from suckers and thick-growing branches, and freighted with large and well-ripened products, such as none of us would object to having in our fruit cellars.

The committee are satisfied that great progress has been made in this department of horticulture in Hampden within a few years; and they cherish the hope and expectation that the county will ere long be in no respect behind her sister counties.

RICHARD BLISS, *Chairman.*

FRANKLIN.

From the Report of the Committee.

We are glad the attention of the farmers is now turned so generally to the cultivation of good fruit, partly because we regard it as one of the most lucrative employments in which they can engage. There is no longer any force in the old objection, that there is no use to raise good fruit, because there is no market. Now the market of the world is open to the American orchardist. The shipment of American apples of the finest quality to England is now a regular and profitable branch of commerce. Downing says that no apple that is sent from any part of the continent of Europe commands more than half the price in London that is readily paid for Newton Pippins.

We rejoice in this increased attention paid to the raising of fruit, because it is one of the most attractive and interesting occupations of the farmer. If one would strongly attach himself to his home, let him engage in the culture of choice fruit of every variety. He will find pleasure and excitement in it; he will watch the growth of each tree with interest; it will hold to him the relation of personal friend. Even the fruitful prairies of the West will hardly tempt him away from the New England hillside, where he must leave behind him these objects of his watchful care.

We are glad to see so much fruit raised, because we believe fruit to be a natural and wholesome article of food, of which most families partake only too sparingly. The reason they assign is, that they are not fond of fruit; which is not strange, when the poor quality of most of that with which they have had experience is considered.

The committee first gave their attention to apples, of which a truly beautiful display was made. We are pleased to know that so many of our farmers can show from twelve to twenty, and even more, varieties of apples of first quality—apples which it did our eyes good to see, and which will gratify other senses than the sight in the course of the coming winter.

John F. Moors, *Chairman.*

BERKSHIRE.

From the Report of the Committee.

The increased attention to the culture of fruit in Berkshire County is a matter of congratulation. Believing, as your committee do, that our soil and climate are well adapted to the culture of choice varieties of apples, pears, and peaches, and that from no other product can equal profit be realized, we confidently commend the subject to further attention. For the first time, so far as we are advised, peaches have this year been exported as an article of commerce from the county; and the product of one of our farmers has amounted to one hundred bushels. Fruit has the advantage of most products in finding a market. The demand is always greater than the supply. Few are furnished with all the fruit they desire; and an increased consumption will tend to the profit and pleasure of the consumer. The product of our orchards this year is unusually good, and the contest for premiums spirited.

Alexander Hyde, *Chairman.*

HOUSATONIC.

From the Report of the Committee.

Such was the general excellence of the varieties of fruit offered, that it was difficult to make any decision entirely satisfactory even to the committee themselves. The display of fruit was large and tempting. The peaches, in particular, were unusually large and of a delicious flavor. There is no reason, in the opinion of your committee, why Berkshire should not compete, and successfully too, with more southern latitudes in the production of this crop. We trust that the old notion which has too long prevailed, that it is useless to attempt any thing serious in fruit culture, will have soon exploded. It has, in years gone by, been customary for our farmers to stick a peach tree in some forsaken corner where nothing else would grow, and draw from its unproductiveness the inference that the crop in this region must necessarily be a failure. It is well for the interests of agriculture that all crops are not similarly treated.

Francis Eddy, *Chairman.*

NORFOLK.

From the Report of the Committee.

In the last Annual Report of the Fruit Committee of this society, the vast importance of fruit culture was urged on the ground of economy in living, of health, of refreshment, and of enjoyment, in hopes to stimulate to an increased planting and cultivation.

It has been found by observation and experience,—

1st. That fruit is a very economical article of food when compared with meats and mixed dishes, even at its present scarcity and consequent high price.

2d. That it is not only the most conducive of any article of diet to the general health of families, particularly of the young, but that it is a panacea in many diseases, and that it is the most salutary and strengthening medicine for invalids.

3d. That to all, young and old, and of every condition and stage of life, fruit of various kinds forms a delicious refreshment, and that it is a universal delight.

4th. That it is a diet most of all favorable to mental activity, and contributing, in a high degree, to liveliness of spirits and serenity of mind.

And, besides these reasons for its more extended culture and use, it should be observed, that, as fruit is thus the principal food of a highly-cultivated, refined, and paradisiacal state of society, it will be more and more in demand continually; and the wise agriculturist and thrifty farmer will find his account in making large plantations of various fruits. In New England, fruits of all kinds, save apples, are still extremely scarce and high; and even this more common fruit, the year preceding, was beyond the reach of the great mass of people. During the last year, and in fact we may say in most years, peaches in this part of the country are by the many wholly unattainable as an article of regular common food, however they may be in New Jersey and its highly-blessed neighborhood; and at no time can eatable pears be purchased in our market save at most exorbitant prices. And yet there is no reason why, in heavy, clayey soils, properly drained and manured,—for such soils doubtless are most desirable, being native and specific to the pear,—or in any well-tilled soil that is retentive of moisture, orchards of this so various and delicious fruit might not be grown as easily and as universally as those of the apple, and made to bear more regularly and abundantly, as is the nature of the pear to do. And we believe that a large orchard of Bartletts, Andrews and Flemish Beauties, or a plantation several acres in extent of Onondagas, (Swan's Orange,) Lawrences, and Columbias, would be one of the grandest and most glorious horticultural experiments that could be tried in New England, and would in the end bless the originator with the richest golden harvest; and we hope speedily to see encouraging prizes offered by our various agricultural societies for such orchards and plantations of pears. We have space, however, in this report to dwell only upon one point in fruit culture, suggested partly by the past season, which has been so peculiarly distinguished by the excessive coldness of its winter, and the severe, long-protracted, and extensive drought of its summer; and this is the subject of "mulching" our fruit trees.

There are three grand difficulties that beset the common farmer in his efforts for the growth and perfection of his fruit trees and fruit, from which, indeed, the most learned, skilful, and accomplished fruit grower cannot wholly escape:—

1st. The labor, expense, and difficulty of properly enriching and tilling the soil around his trees.

2d. The great severity of our winters; or, more correctly, the violent changes from warmth to cold, and the sudden and alternate freezing and thawing that distinguish the wet season, or the winters and springs, of our climate, and that often prove so destructive to trees and vines of various kinds.

And the 3d, and perhaps greatest trouble of all, the frequent length of our dry seasons, and the excessive severity of our droughts.

It would be difficult, perhaps impossible, to name any *one* thing that would prove a perfect panacea for all these evils, and that could cure them all by one and the same application; and yet we will venture to assert that the practice of thoroughly mulching our trees will approach nearer to such a panacea, and will prove more effectual in the removal of these difficulties, than any thing else that could be devised. As much as we ourselves have said, as much as has been written, in regard to the matter, we think the subject is by no means exhausted, and that the various benefits of mulching are but very little understood in regard to its action upon fruit trees and fruits.

1st. In regard to its effect upon the tillage of the soil. If the farmer has little time and means to expend in enriching the ground about his trees, let him cover the surface above their roots with fresh-mown grass or leaves,—the best mulching,—or with hay, straw, shavings, chips, or sawdust, and he will find, not only that the moisture that contains the food of the tree will be preserved, but that the earth is kept as light, as friable, and almost as pulverulent as though it were continually tilled. And when the mulching has become sufficiently decayed he can increase its beneficial effects by turning it under, previous to applying new. A gentleman whom I have long known as a very intelligent, skilful, and highly-successful arboriculturist,—I allude to Henry L. Penniman, Esq., of Dedham,—makes no other application than that of new-mown grass to his thrifty and productive trees. Nature herself, in her fresh, green, waving groves and gigantic forests, often growing out of the bed of decaying rocks, always thus mulches and nourishes her trees and keeps them flourishing and vigorous. This kind of nourishment, though deficient doubtless in exhausted soils in certain necessary elements of growth, has the advantage of never being injurious to trees by its over-stimulating qualities, as is the case sometimes with stable manure, super-phosphate, guano, &c.

2d. The protection afforded to the roots of trees in winter by mulching is such as to prevent the violent action of heat and cold, that so often proves fatal to the peach especially, and not unfrequently, in high northern latitudes, to the quince and pear. Indeed, few peach orchards or pear orchards will be allowed to remain in coming times without this protection.

3d. Mulching in times of drought prevents evaporation, and thus secures sufficient moisture, and a consequent abundant supply of the gaseous elements contained in the moisture, which compose the food of plants and trees; for, deprived of the nutritious elements thus held in solution in water by the drying up of the soil, the young tree, recently planted, withers, fades, and dies; the larger trees languish, the leaves grow yellow, the fruit is either for the most part knurly and imperfect, or drops prematurely from the tree, while that which remains and matures goes swiftly to decay after it is gathered. Of these evils, mulching is the greatest cure yet discovered, and its effect always is to produce a healthy, thrifty, generous growth, with fair, juicy, abundant, and lasting fruits.

James Richardson, *Chairman.*

Statement of A. W. Stetson on the Method of preserving Apples.

The fruit must be taken from the tree by hand, wrapped in paper, (common "tea paper" is preferable,) and put in cork dust, which costs about $1.25 per barrel. One barrel of cork dust is sufficient for four barrels of fruit. It is not necessary to head the barrel. By this method apples will retain their flavor for six or eight weeks longer than by the ordinary way. It is perhaps unnecessary to say that the fruit must be sound, and not over-ripe, when put in. The fruit, when barrelled, must be kept in a cool place; but, from my experiments, it is a matter of indifference whether it is damp or dry. I have tried this method of preserving my apples for three years, and have, from time to time, exhibited them at the Horticultural Rooms. The cork dust will retain its efficiency for some years.

BRISTOL.

From the Report of the Committee.

Our spacious City Hall was well and amply filled with the varieties of the fruits and flowers which the season affords. Although the general prematurity of the fruits of the present year had nearly deprived us of some of the varieties which usually occupy a conspicuous place in our exhibitions, yet, under this disadvantage, the display, both in quantity and quality, was a marked advancement over that of last year. Indeed, the evidence which our exhibitions furnish of the gradual improvement, year by year, of fruit culture in this county, is the most satisfactory feature attending them.

The time of year selected for this agricultural anniversary is not that in which flowers are to be found in their greatest perfection. Their season is mainly over; they have most of them already withered on their stems; and they necessarily become a less prominent feature of an autumnal than they would be of a spring or of a summer exhibition. The display, however, of flowers yet in season was very creditable. There were some rare and choice specimens of plants in pots from gardens in this vicinity. Many beautiful varieties of the dahlia —queen of our autumnal flowers—were exhibited; while the verbenas from the garden of John B. Burgess, who has been quite successful in the production of new varieties of this delicate little flower, are entitled to especial notice.

But it would ill become us to assume too much; for, however well we may have done in the few years which have passed, this is no time for resting on our laurels. There is a wide field for improvement yet open before us; and there must be no relaxation in our endeavors. Other sections of the country are advancing with at least an equal rapidity; and earnest effort alone will prevent us from falling behind them in the race. Let us be careful, then, to do our part in showing that it depends more upon the industry and enterprise of the people than upon the quality of the soil whether our fields shall be neglected and covered with brambles, or at best be only half tilled, or whether they shall be made to rival in productiveness the gardens and vineyards of the more highly-cultivated portions of the older world.

THOMAS A. GREENE, *Chairman.*

VEGETABLES.

ESSEX.

From the Report of the Committee.

Your committee see no possible reason why this department of agricultural industry should not be suffered to be more fully represented, the more especially when they reflect how much indebted the farmer is to this branch of culture. A scale of the comparative value of each kind of vegetable to the Essex County farmer might be carefully instituted, which should serve for some guide in offering pecuniary or honorary encouragement for the production of new varieties. Are roots better adapted to our hard and stony soil, or rather to the average soils of our county? If so, what kinds should take precedence? This determined, let it stand at the head of the list, and let it be represented under its very best conditions. Can it be improved? Experiment will only decide; and where sufficient encouragement shall be presented, the experiment will be readily essayed. What next should occupy the second place in the series? what the third? and so on. Thus an approximation to the capabilities of the soil of the county can be ascertained, and a promising result, in the long run, be anticipated, while at the same time a system may be established. To systematize all kinds of labor has been always found advantageous. Why should it not obtain equally here?

Your committee would suggest to the consideration of the society the expediency of offering premiums for the introduction of new varieties of vegetables, to be awarded after a sufficient time has elapsed to test their desirableness for extended cultivation. Perhaps, should a liberal premium be given for the best seedling potato raised in the county,—one that would not be liable to the rot, of a large yield, and combining other good qualities,—a great desideratum would be supplied; also the introduction of new varieties of other esculents, to take the place of some which upon repeated trials are proved of an inferior quality, or not adapted to this soil and climate. Many of our vegetables may be improved in quality and quantity, and made to ripen earlier, particularly those that are raised from the seed by a proper selection of seed gathered from the healthiest and most advanced plants.

The number of contributors to this department was sixty-eight, as follows: From Lawrence and Methuen eighteen each; Andover, eleven; Haverhill, five; Danvers, four; Georgetown, three; Beverly, Marblehead, and Topsfield, two each; Bradford, Boxford, and Lynnfield, one each. It will be perceived that only twelve of the thirty-two cities and towns in the county were represented; and of these there were very few contributors except from those in the immediate vicinity of the place where the exhibition was held. This should not be the case; a more general interest ought to be awakened, and every town be represented. Those residing at a distance, and particularly not on the line of a direct railroad communication, are obliged to undergo some inconvenience in forwarding specimens, and also to the attending of their removal after the exhibition. This may be obviated in a great measure if an arrangement can be made by which the articles thus exhibited can be sold under some prescribed regulations of the society, and the proceeds accrue to the benefit of the contributor. The excellence, beauty, and intrinsic value of the specimens exhibited would attract many who would wish to buy, and thus relieve the trouble of removing the articles by the exhibiters. To secure the most efficacious plan for the subsequent display of a more extended character in the vegetable department, some such scheme might be adopted; at least it is deserving of consideration. Your committee trust that the above suggestions, if deemed impracticable or inexpedient, will induce those upon whom this duty may devolve to devise some other plan or plans that will not only retain the present degree of interest in this department, but lead to the gradual extension of its importance and of its utility to the productive industry of our county.

Respectfully submitted,

HENRY WHEATLAND, *Chairman.*

MIDDLESEX.

Report of the Committee.

When we take into consideration the vast amount of vegetables consumed as food, both by man and beast, we think the importance of their extensive culture can scarcely be overestimated. Your committee, therefore, are highly gratified in being able to state that the display at the society's room on this occasion, notwithstanding the protracted and severe drought which prevailed during the season just past, and which must have retarded their growth to a considerable degree, will compare favorably with the exhibitions we have had on previous years. The display of potatoes, well-grown ones too, has seldom, if ever, been excelled within our recollection. More beautiful specimens of beets, turnips, parsnips, carrots, and squashes we do not often see. In view of these facts, your committee are unanimously of the opinion that there are cultivators in Middlesex County who understand the advantages to be derived from deep ploughing, manuring well, and in giving their crops clean cultivation. Noxious weeds should never be allowed to grow among vegetables or plants of any sort. Stirring the earth often is not only advantageous in destroying weeds, but especially is that mode of treatment necessary on the approach and during the prevalence of such a season as we have just experienced. Not that your committee are of the opinion that frequent stirring enables the soil more readily to absorb the dews,—which idea has been advanced by some individuals,—but that keeping the surface of the earth light cuts off in a measure the communication between the earth and the atmosphere, checks evaporation, and, as it were, compels Mother Earth to retain her moisture much longer than when she remains undisturbed. More on that head we should like to say; and, to do any thing like justice to the subject, we could not say less.

Asa Clement, for the Committee.

Concord, October, 1854.

WORCESTER NORTH.

From the Report of the Committee.

Your committee have not thought it their duty, or the best method of promoting the objects of this society, to encourage by their premiums the growth of merely mammoth specimens, especially since most vegetables of that description are really less desirable and less valuable for use than well-grown specimens of medium size and of a vigorous and natural growth. It is well understood to be an easy matter to force the growth of vegetables as well as of plants; and we have felt it our duty to award the funds appropriated by the society for specimens of fair and smooth exterior and solid character, grown in the ordinary manner, and the results of judicious cultivation, rather than for merely large specimens—nothing being known of the manner of cultivation or of the quantity and quality of the whole crop compared with the expense of raising it.

Among other things deserving special remark, your committee believe the exhibition of potatoes and squashes—which are, perhaps, the most important of the products of the garden—to be remarkably good, whether we consider the variety or the quality of the specimens. We have rarely seen potatoes of better appearance—and this, too, notwithstanding the peculiarly unfavorable nature of the season for their production and growth.

Moses G. Lyon, *Chairman.*

HAMPDEN.

From the Report of the Committee.

There is perhaps no department of agriculture that better remunerates the tiller of the soil than the culture and growth of vegetables, especially in the vicinity of our large towns and cities, where a greatly increased cultivation of them is of late very visible. What farmer in our county, fifteen years since, thought of giving the labor of one man, one day of each week, to raise "garden sauce" for market? The pioneer who led in this branch of agriculture was the late Richard Bagg, Jr., whose memory will long be cherished by the members of this society for the active interest he ever manifested in its welfare, and also by the community in which he lived as an intelligent and worthy citizen, whose varied operations combined more of method, of science, and of system than is often found united in any one farmer. His was an example well worthy of imitation by our young men, and especially our farmers.

Among the rare specimens in the exhibition of the present season was a variety of corn, the seed of which was obtained from the Island of Cuba, and one of the stalks of which was sixteen feet in height, the ears being eleven feet from the ground. It would seem to be peculiarly adapted to those localities where little or no grass is grown, and where, as a substitute for hay, the leaves of the corn stalk are plucked and cured. A specimen of Japan pease was also shown, and is evidently well adapted to our soil and climate. Some fine sweet potatoes were also exhibited; and the committee would remark, that the success with which this vegetable has been cultivated of late years in northern latitudes shows that we have all around us a soil admirably suited to its growth, and that our light, barren, sandy plains, when stimulated by manures, will produce this esculent in perfection. The three products above named were grown and exhibited by Philos B. Tyler, of Springfield, and were attractive objects in the display of vegetables.

JEHIEL ABBOTT, *Chairman.*

THE ECONOMY OF AGRICULTURE.

A Prize Essay, from the Transactions of the Hampshire Society, 1853.

BY L. WETHERELL.

THE word *economy*, at the present day, has a great variety of applications. The ancient Greeks used it only with reference to domestic affairs, never applying it to agriculture as now employed, but using the word *geoponics* whenever speaking of what related to the tillage of the earth. From the word *husband*, which means a farmer, or cultivator of the soil, is derived husbandry, which signifies the business of a farmer, or of one engaged in agriculture; so that all that is contained in the expression, "economy of agriculture," is imbodied, or nearly so, in that good old Saxon household word, "husbandry," which is perfectly familiar to all whose mother tongue is the Anglo-Saxon.

Knowledge gives power to those who enter into partnership with Nature for the purpose of multiplying those products upon which man must subsist while a denizen of earth. Such knowledge as is derived from experience and observation is unlike that which is obtained from theory predicated of hypothesis, founded upon speculation. Theory is only valuable when founded on inferences drawn from principles established upon facts derived from experience and careful observation in the laboratory of Nature. Theory, in this sense, is true science, which is to know—or, in a more general sense, certain knowledge, comprehending such facts and truths as will enable even a novice to practise the art with a good degree of success. Theory, in any other sense, is science, falsely so called. Thousands, after having seen the end and folly of hypothetical theories, are led to denounce all theory; which is about as wise as it would be to refuse all coin because of the equally well-known fact that there is counterfeit coin in circulation. Such show greater weakness in this case than they did by suffering themselves to be imposed upon by a mere charlatan at the outset.

The "application of knowledge derived from experience" is as essential to the agricultor as to the lawyer, the physician, the clergyman, the statesman, or those engaged in any other vocation where these elements are considered requisite and necessary to prosperity and success. Knowledge derived from tradition, it will be admitted, has had, and is still having, too much influence in most of the arts and professions. Do not eschew knowledge because it comes to you through the medium of tradition, neither receive it because it claims experience as its indorser; for, in either case, you may be deceived. The Baconian, or inductive system, as it is popularly denominated, is almost as fruitful of imposture, as now held and practised, as the old system of philosophy which it supplanted. The rapid generalizations and hasty conclusions denominated "knowledge derived from experience" constitute one of the great evils of the present age; and no vocation or profession, perhaps, is more infested with pseudodoxical experimentists, or self-styled inductive teachers, than that of husbandry.

Agriculture as an art has always been found in the highest state of perfection where the greatest advancement in civilization and enlightenment have been made. In tracing the history of civilization in connection with agriculture, it is found to consist of four distinct periods—viz., that of the hunter, the shepherd, the farmer, and the gardener. Hunting, in the first period, was practised for the purpose of procuring the means of subsistence. The comforts, and pleasures, and luxuries of life are almost unknown in this state of society. Caves and caverns, in northern latitudes, are to the people as houses, to protect them from the inclemency of the weather and the peltings of the storm. Lot dwelt in a cave—he and his daughters. From the savage life to that of the shepherd, or pastoral, the benefits or advantages over the former are of a positive kind. A home, a more certain subsistence, and more leisure for intellectual pursuits are enjoyed. The life of the shepherd is less the life of a wanderer than that of the savage, and, without mental culture, tends to indolence. The prescriptive right of the shepherd tended to bring about the permanent division of land into farms, and to establish the right every individual has to the fruit of his own labor. Thus dawned upon the pastoral, or shepherd life, the agricultural, which was soon succeeded by the horticultural period, which is the highest state of terra-culture, and with it is generally found associated moral and intellectual culture, and, necessarily, a highly enlightened and advanced state of civilization.

Hence it may be inferred, that, whether a knowledge of agriculture and horticulture was originally imparted to man by his Creator, and partially lost by the fall and the barbarism which succeeded, or whether it is man's discovery, its introduction among savages has a tendency to produce civilization.

The conquests of Cæsar introduced agriculture into Gaul, and converted her woods and marshes into fertile and fruitful fields. Thus have war and conquest on both continents been succeeded by a higher state of civilization; and so has been partially realized the fulfilment of the prophecy, that the sword and the spear shall be converted into implements of husbandry.

It was the boast of Pliny the historian that the arts introduced by the Roman conquests had diffused happiness over the earth. Modern testimony tends to confirm this statement. Visit the islands of the sea; and where you find the people skilled in the art and practice of agriculture they will be found subordinate, docile, and gentle.

This art, which has had so powerful an influence in the civilization of man, lies at the very foundation of both individual and national growth and prosperity. The economy of such an art is, truly, worthy of consideration; for whatever tends to increase the productiveness of agriculture communicates happiness to individuals and energy to the state.

A complete knowledge of "the economy of agriculture" is a *desideratum* that has been long and diligently sought, but, like the philosopher's stone, still remains hidden in the dark recesses of Nature. It is true that some progress has been made in the art of cultivating the soil; yet it is equally true that much remains to be known before the most economical mode of changing inorganic bodies into organic can be successfully practised, or, in other words, before the shortest and best way of changing earth into gold is attained.

No specific science has done more to reveal the hidden mysteries of both the organic and inorganic kingdoms than that of chemistry. But chemistry, even with all its power of analysis, fails to gain access to the penetralia of Nature's hidden mysteries, concealed where neither the eye nor human reason can ever penetrate, how eager soever they may be in their toils and analyses.

The "economy of agriculture," if duly studied, will guide a man in the investment of money or credit; in the purchase of land which it is proposed to work; in the locating and constructing of the buildings thereon, or, if they are already erected, in rendering them convenient and suitable in every respect to compass the end for which they were built; in fencing; in stocking, if a grazing farm, whether with sheep or some other animals; if cows, in selecting with reference both to the quantity and quality of milk produced. So of sheep, with reference to the fleece; if a grain farm, in the selection of all the farm implements; teams for work, whether horses or oxen; grain to be used for seed; the right time to plough, the depth, the number of times; what manures or other stimulants shall be employed, how much, when, and how; when to sow; how to cultivate, and shield, and preserve from the destructive ravages of insects; when to harvest, as well as how; when to market, as well as where, by whom, and to whom. So also with regard to the products of the dairy, if a dairy farm; or the fruit, if raised in abundance. And so of every thing, whether bought or sold. Be able to nick the time, and never have occasion to say, Had this, that, or the other thing been known, a better crop might have been produced, or a better breed of cattle purchased for stock raising, or a better method of fattening animals employed, or, when fattened, a better time for selling for the shambles selected. These are a few of the numerous topics of which the "economy of agriculture" should take cognizance.

By it a man should determine whether, in the selection of a farm, it will be better for him to purchase a grain farm or a grass farm. If, in the light of economy, he shall determine on a grazing farm, some of the inquiries which immediately present themselves are, how to produce the greatest and best amount of grass; how to obtain such cows as shall, from the consumption of a given amount of grass, produce the greatest and best quantity of milk for butter or cheese; whether it is better to sell the milk, or convert it into butter or cheese; or whether it be better to do all at different periods during the season—the end in view always being to secure the greatest dividend for the money and labor invested; whether it will be better to soil the cows, or turn them into the lot to feed upon the grass themselves; whether it will be better to raise the calves, or send them to the butcher as soon as they are old enough for the market.

Every farmer needs to know, in order to derive the greatest gain from keeping stock of any kind he may choose, how to select with reference to the end in view. If he raise sheep, he needs to know how to select that variety which shall convert the feed consumed into the greatest return, whether of wool or mutton; if cattle for the stall, how to select such as shall convert their feed into the greatest amount of muscle and tallow with the least waste; how the feed shall be prepared for the animals in order to do this. Reference is to be had, also, to the temperature and ventilation of the stable where the animals are kept during the days of fattening. Experience, observation, and the fruit of right experiment can approximate very near the truth in all these matters. With reference to the breed of cattle, the great inquiry is, not, necessarily, which will grow the largest, but which will, without reference to size, convert grass and grain into gold fastest; for what else is an animal, in the all-comprehensive view of economy, but a machine to be employed for this very purpose? All else is mere fancy.

In order to reach the highest perfection in the economy of agriculture, it is necessary that the tiller of the soil should be the proprietor of the same. Man labors more intensely when working for himself, and those directly and rightfully dependent upon him, than under any other conceivable circumstances.

The great improvement in the art of tilling and reclaiming the soil in Flanders is owing chiefly to peasant proprietorship. The Flemish people have practised, for centuries, rotation of crops and economy of saving and making manures that are introduced as modern discoveries in English farming, about which so much is said and written at the present day. It is conceded by English writers even that Flemish agriculture is now superior to that practised in England. The English do not hesitate to say that the cultivation of a poor, light soil is superior in Flanders to that of the most improved farms of a similar kind in Britain. We greatly surpass the Flemish farmer, say they, in capital, in implements of tillage, in the choice and breeding of domestic animals generally, though it is conceded that the Flemish excel in cows. The British farmer is better educated than the Flemish; but in the minute attention to the qualities of the soil, in the management and application of manures of different kinds, in the judicious succession of crops, and especially in the economy of land, so that every part shall be in a constant state of production, we have still something to learn from the Flemish—not from an instructed and enterprising peasant here and there, but from the great mass of the workers of the soil.

The most highly-cultivated portions of the country consist chiefly of farms owned and cultivated by peasant proprietors. Spade husbandry is either wholly or in part employed by them. Whether the land is cultivated by the spade, or plough, all the members of the family engage in it—children doing the lighter work, such as weeding, hoeing, feeding the cows, and such like. Suppose the farm to consist of six acres—which is a common area for a farm in Flanders. One man and his family can manage it. If he has a wife and three young children, all of whom are considered equal to three and a half grown-up men, the family, according to the authority quoted, will require thirty-nine bushels of grain, forty-nine bushels of potatoes, a fat hog, and the milk and butter of one cow. An acre and a half of land will produce the grain and potatoes, and allow some corn to finish off the fattening of the hog, kept on the extra buttermilk, &c. Another acre in clover, carrots, and potatoes, with the stubble turnips, will more than keep another cow. Two and a half acres of land thus suffice to furnish this family with food; while the produce of the remaining three and a half acres may be sold to pay the interest of the purchase money invested, wear and tear of implements, extra manure, clothing for the family, &c. Thus it is seen how a family can live and thrive on a farm of six acres of moderate land.

This is a brief detail of one six-acre farm in Flanders, given in order to show what peasant proprietorship is doing and demonstrating on the side of economy in agriculture, more especially where the soil tilled is owned. Give a man the ownership with a title deed of a flat rock, and he will convert it into a fruitful field; but give him a ten-years' lease of a well-cultivated farm, and, nine chances to one, he will convert it into a fruitless waste. Wherever ownership vests in the soil in Europe it has stimulated the poor man, or the laborer rather, to work it even to the conveying of earth in baskets upon the back, far up the mountain side, where Nature had denied a soil, in order to render it fertile and productive of the substantials of animal nutrition.

Circumstances which will suggest themselves to the reader make a difference, it is true, between proprietorship in the soil here and in Flanders. These, however, do not essentially vary the economic bearing of the facts quoted.

Perhaps there is no department of the economy of agriculture where farmers and gardeners suffer so much direct loss as that which pertains to animal excrements and urine. There are very few farms in any country that will produce good crops for any length of time without the application of manure. The farmer in New England is ready to admit that he has no reason to expect a plentiful harvest where he has not made a plentiful use of manure. This being granted, all animal excretions are, or should be, regarded as being of too great value to the husbandman to be suffered to be lost, wasted, or improperly employed. After having made such arrangements with reference to saving them that nothing be lost, the next important consideration is how to use them, various and unlike as they are in their qualities, so as to derive the greatest returns in crops for their expenditures.

This knowledge can only be obtained by experience—the great teacher in terra-culture. In experimenting, the intelligent manipulator may derive some aid from the science and art of chemistry, as well as from direct experiment and observation. If the farmer can know what the elements of animal excretion are, when he knows how the animal has been fed, much is gained. That he can acquire this knowledge from chemical analysis very nearly, will be generally admitted. Analytical tables to which farmers have access have been made, exhibiting the elements of the excretions of different animals. The urine is said to be far richer in nitrogen, alkalies, and alkaline salts than the solid excrements; yet how few of the farmers save it in such a way as to be able to use it on their soil as a fertilizer! The humus-forming substances abound much more plentifully in the solid excrements than in the liquid. It is the remark of a modern writer and chemist, that "the solid excrements of herbivorous animals are rich in humus-forming (organic) and seed-forming substances, (phosphoric acid, lime, and magnesia,) but poor in forcing and leaf-forming substances, and that the urine of the same animals is rich in substances forming stalks and leaves, (nitrogen, potash, and soda,) but deficient in the seed-forming mineral nutrients," and is better adapted for forcing purposes. The quantity, quality, and condition of the food, whether cooked or not, as well as the tending, treatment, and employment of animals, all have an influence upon the excrements which are to be employed as stimulants for the soil.

Every farmer should have a tank, or tanks, conveniently located for the immediate reception and preservation of all urine until required for use. This is one kind of economy that has been almost entirely overlooked by farmers. Facts will justify the assertion, that the best of our agriculturists lose nearly half the fertilizing elements of the animal excrementitious substances before employing them upon the soil. To show the importance of urine, read the following statement concerning it:—

If the urine of a cow, for a year, were collected, it would furnish about 672 lbs. of solid extract, which contains as much nitrogen alone as 560 lbs. of the best guano, and so large a quantity of potash, that, by combustion, it will yield about 170 lbs. of potash, worth, in commerce, from $20 to $25. In view of these facts, the annual urine of a cow is taxed at three guineas, or about $15, in Flanders, where agriculture has reached its highest perfection. A celebrated English farmer states that in manuring meadow land he has obtained far greater effect from 175 lbs. of sewer water from the city of Edinburgh, consisting for the most part of urine, than from 336 lbs. of stable manure, and the same quantity of guano as stable manure, with which he manured three equal parcels of land.

In view of such facts, every reflecting farmer must concede that he loses annually a large amount of fertilizing elements in not saving all the urine of his establishment. In addition to this, much that is poured into the drain at the "back door," to putrefy, would, if poured into a tank and saved, furnish, in the course of a year, a large amount of valuable liquid manure.

Stable manure, by being kept in pits prepared for the purpose, would be worth far more than when exposed, as it too often is, to sun, wind, and rain. Under-ground stables protect it somewhat; but these are objectionable. The fumes rising from the accumulated and accumulating droppings, lying beneath the floor, constantly diffuse themselves throughout the stable where the cattle are kept, and thus make the stable air exceedingly bad—rendering it impossible to give the animals any thing like a healthful atmosphere. Another objection is, having the cattle stand so far from the ground. Pits for the reception of the solid excrements and tanks for the liquids should be provided, so that all can be saved in such a way as not to be offensive either to man or beast, for the cultivated fields need them.

When all the animal excrements are saved to the best advantage, and sufficient knowledge derived from experience is gained so as to use them in the way that shall render them in the highest degree productive in the return of crops, it will be found that farmers still need more. What shall be done? They must next resort to artificial manures, as auxiliaries to gain the end desired—to wit, the maximum production of every cultivated rod of ground that they till. A Saxon agriculturist of much practical experience on this subject says, "The more extended employment of artificial manures is an advance in farming that has already opened a new era. By this means the business of a farmer is becoming more closely approximated than formerly to that of a manufacturer; for, whilst formerly our farming arrangements were conducted in the manner which the quality of manure produced on the farm itself prescribed, we are now free to cultivate, as may seem most profitable, every plant which is suited to the soil. Yea, still more: we can produce, as it were, with a single effort, fine harvests from worn-out fields; we can, in such a case, secure, in two or three years, the same results for which formerly ten or twelve years were required."

Every farmer should, in addition to the animal excretions which he possesses, be in the way of employing such artificial manure as he can most readily and cheaply furnish himself with. The following, by way of suggestion, is copied from an English farm journal: Guano, urate from the London poudrette manufactory, bone-dust, super-phosphate of lime, humus, rape-cake, woollen rags, sulphate and muriate of ammonia, saltpetre, Boast's mineral manure, alkaline manure, soda, soap-boilers' ashes, gypsum, chloride of lime, &c. Here the intelligent tiller of the soil has a fruitful theme for reflection and experiment—to wit, to learn the effect of these several manures upon his soils, and how to supply them in producing his various crops, so as to learn which of all these varieties, with others not named here, he shall, in the light of economy, procure.

The great end to be reached by the use of manures is, such a stimulation of the soil under cultivation as to obtain from any given area the greatest possible amount of produce adapted to the feeding of man and beast, both being alike dependent for nutrition on the vegetable kingdom. The art of feeding animals, like that of plants, is but poorly understood, even by the best agriculturists, at the present day. "Knowledge derived from experience" has been kept in the background by prejudice and superstition—guides of a stumbling and perverse people. There seems to be very little more known to-day on these subjects, notwithstanding the boast of progress in these latter times, than was known to Abraham, Job, and Jacob. Yet it would seem that many of these great problems, that lie at the very foundation of agricultural economy, might be solved in one generation, and even in less time, by experiment—just such as the most common farmer can make. The speculations of the man of science in the laboratory can never do it, else a-

Liebig would have attained unto it ere this. The chemist has done something, it is true, by way of analysis, but very little by way of didactic teaching. Such knowledge as the farmer needs and must have, in order to advance the art of agriculture and perfect its economy, can only be obtained by careful observation and experience in the great laboratory in which Nature works, and works to some useful purpose—where her experiments are synthetical rather than analytical—where she produces something, when supplied with the right elements, that gladdens and enriches him who engages in partnership with her. He who, by observation and experience, has learned how to raise the maximum number of bushels of wheat, or corn, or any other grain, upon an acre, and can so employ his knowledge as to produce the given result whenever he has the opportunity, knows what is of infinitely greater value to the world, when imparted, than to be able to analyze a kernel of wheat and tell the staring crowd of what chemical elements it is composed. As an aid, every intelligent man welcomes Chemistry; but let no one be misled by her claims as set forth by some theoretical pretender who is ignorant of the very first rudiments of good farming. Nature abounds in mysteries which no science can ever fathom; yet forget not that science will aid you in experimenting in the art of plant culture. What the farmer needs to know beyond a wherefore is, how to furnish manures containing just those elements which the seeds, planted or sown, after germination, shall need to nourish and supply them until matured and ready for the harvest. This knowledge can be gained by experiment. So, again, when the crop is harvested, how he shall feed it, if to be given to brute animals, so as to derive the greatest possible profit from such an expenditure; for both the plants and animals thrive best when supplied with such nutrition as is best adapted to their own peculiar wants. Nature, both in animals and plants, discovers wonderful powers of adaptation to circumstances. A plant grown in pursuit of proper nutrition under difficulties will be but a poor specimen from Nature's workshop. Hence it is reasonable to infer that all medium crops, as well as those below this standard, are specimens of this kind of production. The proposition, then, that medium farming does not pay, will need no argument to establish its truth. No man can long afford to be a medium farmer. No man would long be contented with three per cent. interest on stocks or money loaned when he could just as well have six per cent. and a better security. Good agricultural economy is that which ends in maximum harvests from minimum expenditures, and nothing short. It boasts not of its great number of acres under cultivation, but of the quantity produced per acre. Quantity and quality relative to the area are its pride, rather than the great number of acres tilled. No man can afford to raise seventy-five bushels of carrots per acre, when the same area, if well tilled, would produce one thousand; nor three bushels of rye per acre, when forty should be produced on the same surface; nor one-half a ton of hay per acre, when four can be produced; nor wheat at ten bushels per acre, when sixty may be produced under right culture; nor corn at fifteen bushels per acre, when the best culture produces one hundred and fifty.

There are numerous other kindred topics that might be presented for consideration in connection with agricultural economy—such as labor, whether performed by man or by beasts trained for the purpose, or by some other agent of power, as steam; the planting and cultivating of orchards; draining and irrigating; liquid manures as a substitute for those in common use; the employment of lime, how, when, and where; the rotation of crops; subsoil-ploughing; the number of times a field should be stirred with the plough before planting or sowing the seed; whether fall ploughing shall be abandoned; the mode of tilling with the hoe or cultivator, or both; the surest method of destroying noxious weeds; the best way and time of harvesting corn and other grains; when to cut grass to be made into hay, and how to make it so as to render it the most nutritious; the cooking of food for swine and other domestic animals; and, in fine, geognosy, geoscopy, meteorology, botany, zoölogy, ornithology, and entomology, so far as these relate to the economy of agriculture. But, instead of an essay, these topics would furnish matter, if rightly discussed,—to wit, in the light of "knowledge derived from experience,"—sufficient to make volumes. They are all, it will be admitted, intimately related to the topic under consideration; and the completion of the science and the perfecting of the art of the economy of agriculture will never be reached until these relations, as aforesaid, are all studied and learned in Nature's great laboratory.

An attempt has been made in this brief essay to awaken the attention of farmers and others to the importance of the economy of agriculture—the economy of an art that has done, and is doing, more for the advancement of civilization and the perfection of man as a social being than any other of the great family of industrial arts—an art which in ancient times engaged the attention and occupied the time of patriarchs and prophets —(men who lived in close communion with God, and from which Jesus, both the Example and Savior of man, drew his most striking and instructive parabolic lessons of infinite wisdom)—an art that has had attractions for a Xenophon, a Virgil, a Cato, Cicero, Cincinnatus, and a long line of names down to our own ever-honored WASHINGTON and WEBSTER—all men who esteemed agriculture most worthy of their patronage, and felt honored by it, as the most ancient, as it is the most noble and honorable, of earth's vocations. The perfecting of the science and economy of such an art is worthy of engaging the attention of the best intellects of the race; for the time of universal peace on earth and good will among men will not be enjoyed until the perfection of that art, which underlies all real prosperity in every other, be attained. This is to be reached, if at all, by knowledge derived from experience and observation in the laboratory of Nature rather than that of the chemist. Hence the importance of every farmer's keeping an exact record of all his doings—thus accumulating facts from experience and observation such as will aid in the completion of the science and art of husbandry and of rural economy.

THE USE OF MANURES.

From an Address before the Essex Society.

BY RICHARD S. FAY, ESQ.

We must bear in mind that the manure from well-sheltered and well-fed cattle possesses far greater fertilizing properties than that from those which suffer in either of these respects. Self-interest, therefore, as well as humanity, demands from us more care and attention in guarding our stock from the effects of the extreme heat and cold which eminently distinguish our New England climate.

An abundant supply of manure is an absolute necessity to profitable results in agriculture. Possessed of this, almost any soil, if cultivated with a moderate degree of judgment, can be made to produce good crops. This is a plain simple truth about which there is no question; but the moment we come to apply it to practice we are beset with difficulties. There has been so much said and written upon this subject, and so many theories propounded, that it is almost impossible to know what to believe or how to proceed. The action of manure is as puzzling and as unsolved to the farmer as the law of perpetual motion to the philosopher or the squaring of the circle to the mathematician. If one attempts to inform himself from books he soon becomes involved in a labyrinth of contradictions; and if he consults his neighbors he will rarely find any two to agree. One is for long manure, another for short; one is loud in praise of guano; while another thinks it hurts the land, recommending phosphates, salt, soda, lime, ashes, bones, or some other fertilizer as the only valuable addition to his home-made manure; while still another condemns them all, having, perhaps, a nostrum of his own which he considers the only one worth using. Nevertheless, we have some well-established facts to start with; and if we keep them in mind we cannot go very wrong in practice. For example: few, if any, will deny the superiority of barn-yard manure over all others as a means of fertilization; and the reason seems to be obvious enough, since it returns to the soil more nearly than any other all the principles withdrawn from it, in the best condition to insure reproduction. But, where the soil has become impoverished from neglecting this obvious truth, something more may be needed to restore it to a remunerative degree of fertility beyond what our barn yard can supply—in which event we must resort to foreign and artificial manures.

In a case of this nature there is a very safe rule of practice which may always be followed. In the first place we must ascertain from the best received authorities, unless our own experience has taught us, the relative value of the special fertilizer which we propose to make use of compared with barn-yard manure, and the number of tons of the latter which should be applied to the acre. Having ascertained the extent of our deficiency, if we compost with what we have so much of the special fertilizer as will make it equal to a full supply of barn-yard manure, and apply them together, we shall derive the full benefit of both. There is something quite consonant to reason in the composting together all the fertilizing ingredients at our command. We know that plants require many kinds of food for their perfect growth and development, some undoubtedly taking more of one than another. If, however, in the cultivation of one kind, some of the fertilizers thus composted are not wanted, it does not follow that they are lost; they remain incorporated with the soil, ready at a future period to yield their food each to its appropriate plant. If we cultivate, therefore, in a proper rotation, then all that we deposit in the soil under the general term *manure* will be ultimately developed and restored to us in succeeding crops.

The unexampled drought of this season will not have been without its advantage if we act upon the lesson it has taught every observant farmer upon this point. Those crops the maturity of which was hastened by good culture and high manuring suffered but little, while those which received only common attention were very seriously diminished. Two or three additional cords of manure to the acre would have secured in almost every case quite a full average crop thoughout this county. The difference of expense and the difference of result in the two cases is a good profit in the one and a considerable loss in the other. Our farms are too small for expensive works of irrigation; and we must rely, therefore, principally upon our manure heap to guard against the ill effects of drought. It serves us here as a balance wheel in agriculture, warming and invigorating the soil when suffering from too much humidity and cold, and tempering the heat and attracting moisture when the soil becomes from natural causes too dry.*

The great diminution of sheep husbandry in this State is very much to be deplored; it is a striking indication of deterioration and decay in our agriculture, unless we find that something more profitable has taken its place. We shall look, however, in vain for any thing of the kind; every sheep, therefore, lost from the census of 1850, as compared with that of 1840, is a dead loss to the agricultural wealth of the State. Sheep are among the most active and profitable agents in the work of amelioration and farm improvement. Valuable as fertilizers when folded, they likewise improve and renovate pasture lands, brought as ours have been by neglect to a state bordering upon entire non-productiveness.

Two objections are commonly made to keeping sheep: one is, that they are difficult of restraint; and the other, that they are very liable to be worried and destroyed by dogs. With regard to the first objection, it may be said that there are breeds of sheep so docile and quiet that they only require the usual

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* The following table gives the relative value of certain manures, and the proper quantity of each that should be applied per acre on medium soils for the growth of maize and roots:—

Farm-yard manure,	20 tons	per acre.
Night soil,	10 "	"
Crushed bones,	7 cwt.	"
Woollen rags,	12 "	"
Guano,	3 to 4 "	"
Nitrate of soda,	1 to 3 "	with half the weight of salt.
Lime,	1½ tons per acre.	

If every farmer would prepare a table of this kind, adding to it those fertilizers which his experience had proved to be equivalent to a given amount of barn-yard manure, the information to be gained from the imbodiment of it in one report would be very valuable.

fences to keep them within bound. The second objection is a much more serious one, because we have not the remedy in our own hands, unless we keep constantly on the watch against trespassers. Our agricultural towns, however, can aid the farmer very much in this matter. There is no more reason why they should not prohibit dogs from running at large than cattle or any other animal liable to do injury, with such penalties attached to the infraction of any law passed for preventing this nuisance as to insure a proper obedience to it. In many parts of Rhode Island, where sheep husbandry has increased very much of late, the farmers have united together to keep off dogs, allowing no person to go over their land if accompanied by one. Many suffer their dogs to roam about, or to be their companions in the field and on the road, from inconsiderateness; and when once they come to know the injury caused by them they are quite ready to join in preventing it.

There is another subject which does not appear to have received the attention of this society to the extent which its importance would seem to demand. I refer to a well-considered system in the rotation of crops best adapted to our soils, climate, and markets. Chance or convenience is apt to determine our course of cultivation, in total disregard of all the principles connected with vegetable habits and growth. Every farmer knows that a continuous cultivation of any plant takes from the soil those qualities essential to its healthy growth, and that to reproduce it year after year requires the highest manuring possible, and which, however scientifically applied to meet its wants, fails at last to produce a profitable result. We know, too, that certain crops impoverish the soil more than others; that all plants ripened for their seed exhaust the land more than those consumed upon it or removed in a green and incomplete state of growth; that some crops require deeper tillage and are capable of closer and more constant cultivation than others, which cannot be worked upon until ready for the harvest. These are some of the leading facts taught by long experience, which should govern us in establishing certain rotations in crops, without which a high state of fertility cannot be maintained.

The shortest rotation worthy of mention is the four-years' course; that is to say, the whole farm passes under the plough and a summer fallow once in four years. The portion which is in roots the first year is in grain the second, the third in grass, the fourth in grain again, and then goes back to roots, which is the fallow crop—the land then being deeply ploughed and brought to its highest condition, and the bulk of the manure of the farm applied to it. Where the land is not sufficiently strong to bear such repeated croppings the same course is pursued, with this difference, that the land is allowed to remain longer in grass, which, if properly managed, rests it, and prepares it again for another course of tillage. Instead of a four-years' rotation it may thus be extended to any number of years, which is equivalent to having less breadth of land under the plough.

To adapt this or any other system to our farms, we should be forced to extend the time of the rotation very considerably, and to substitute in most cases maize for wheat. This would be an advantage to the land, however, because maize has several of the properties of a summer fallow, being a crop requiring careful culture and a plentiful supply of manure. We can therefore lengthen our rotation without injury, and probably with profit, if we divide the time the land is to remain in grass by cultivating on the same portion at the widest intervals the roots and maize. In pursuing some such system as this we should probably receive the largest return for our manure and keep our land in a good state of fertility.*

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* The mildest rotation that can be established as the practical result of these remarks would be a ten-years' course, which would be based upon the cultivation of one-tenth of the farm in roots; one-fifth or two-tenths in rye, oats, or barley; one-tenth in maize; and six-tenths in grass. Under this course each tenth would be successively cultivated as follows:—

1st	year,	-	-	-	Turnips, or other roots.
2d	“	-	-	-	Oats, rye, or barley.
3d	“	-	-	-	Grass.
4th	“	-	-	-	Grass.
5th	“	-	-	-	Grass.
6th	“	-	-	-	Maize.
7th	“	-	-	-	Oats, rye, or barley.
8th	“	-	-	-	Grass.
9th	“	-	-	-	Grass.
10th	“	-	-	-	Grass.

If the manure heap will admit of it, or fertilizers purchased, it can be arranged so as to get a crop of turnips or of fodder corn the same year with the rye, oats, or barley; but this should not be attempted without very high manuring and thorough cultivation.

REWARDS OF AGRICULTURE.

From an Address before the Middlesex Society.

BY REV. GEORGE E. ELLIS.

In that inspired record which the world reveres we read the solemn sentence uttered to Adam: "Cursed is the ground for thy sake: thorns also and thistles shall it bring forth to thee: in the sweat of thy face shalt thou eat bread." The genius of the Hebrew language, as well as the comment which long experience has written upon that sentence, allows us a considerable range of freedom in interpreting it. What does it mean? Were the seeds of thorns and briers created after Adam's sin, to abate the glory of the first garden, to fret and aggravate the stern tasks of man, and to lacerate the hands which must toil for the body's sustenance? It would be hard to believe that, especially hard to ascribe the vengeful infliction to a good Being, unless some ulterior purpose of blessing be concealed behind the curse. Rather should we say that the sentence indicated a removal from a sheltered garden of ease, and indolence, and unpurchased fertility to the open fields of the world, where the germs of thorns and thistles had been already sown with those original growths whose seeds are in themselves upon the earth. Certain, however, it is, that, if the necessity of toiling amid thorns and thistles is a part of a curse, a compliance with its terms is the condition of the highest earthly blessings known to man. It would be no difficult task, it would require no special pleading, no ingenious tricks of argument, to prove that all human knowledge, science, art, culture, and skill, with some of the richest means of happiness, have come to man directly through the tillage of the earth. The moment man undertakes to pierce the soil he conceives of the use of some tool instead of his own hands, and he devises one, then better and better ones, till art in this direction reaches perfection. How carefully, too, does the husbandman learn to watch all weather signs, the changing aspects of the skies, till he learns the laws of climate, and, if he have a brain capable of philosophic processes, becomes an adept in meteorology and astronomy! The experience which he acquires about the composition of soils and the rotation of crops is the basis of the noble science of chemistry, and of all the individual and national thrift expressed in the word *economy*. What an ingenious process is involved in the simple practice of budding and grafting! What a skilful combination of elemental qualities is shown in the mingling of barren sand, gravel, or clay with the cold and dank soil of the meadows! And as Agriculture has served as the inventive energy to all arts and sciences,—including even Commerce, which exchanges her productions,—it is but meet that all arts and sciences should in turn serve Agriculture, as they now do. And this is, on a grand scale, one of the most striking and beautiful illustrations of that law of reciprocity of service which the Creator has established between all men and all things, including all the stars of heaven and himself. There is not a single science or art which is exempt from this service; and all of them are tributary to Agriculture. Even some of the most retired and speculative men, whose bodily labor you would not conceive to be worth their daily food, are employed upon such ingenious mechanical questions as will inform you, on scientific principles, what are the proper proportions for the size of the hub, the spokes and the rims of your cart wheels, where the line of draught is in a plough for various soils and depths, how thick should be the handle of a spade or a pitchfork, and how to arrange the currents of air for ventilating your barns.

Nor, in this enumeration of the blessings that owe their prime source to the tillage of the soil, ought we to omit that continual demand for industry and hard labor which is the root of so many virtues. Industry and effort are severe conditions sometimes; but how rich their gains, from the health that bounds through the red tides of life within the frame to the stores of the well-filled garner and the joys of a happy home! All the useful discoveries and inventions have come from parts of the globe where hard labor in agriculture has been essential to support life: not a single one of the glorious acquisitions of human skill, and intelligence, and inventiveness has originated in the tropics. More than this: where the hardest labor has been necessary, there, precisely there, has been the most of thrift, and happiness, and virtue. Holland, which by incessant industry reclaimed its soil from the sea and banked out the ocean from her rich meadows; Switzerland, where the flocks and herds have to find their sustenance in three ranges of elevation in the course of a year; England, with her splendid agriculture; and New England, with her rocks, and bogs, and barrens, are proofs of this, that, the harder the conditions of toil, the richer and more various the blessings that spring from it.

I recently overheard in a railroad car the conversation of two young men, one of whom—perhaps both—was evidently on a visit here from the West. It was when the drought of the last summer was doing its worst. They were looking out from the windows of the car upon the successive patches of sand, gravel, rock, scrubby woods, and mullein through which the road wound on. It must be confessed that the region wore rather a hard aspect, and that even the cattle which we occasionally passed seemed to be meditating upon the poverty of the soil; while the chickens were making the most of the grasshoppers, running off what little flesh they had in the effort to get a little more. The travellers made themselves merry over these scenes, where the very ribs of the starved earth seemed to have broken through its lean skin, and they uttered their sharp criticisms accordingly. At last one of them flatly affirmed that he would rather own a ten-acre lot in Wisconsin or Illinois than the land of the whole State. At this point, feeling a little disturbed by their reflections on my native soil, I wanted to ask the youth what brought him here. What was he after here? As I did not put the question to get an answer, I imagined what his answer would be. Perhaps he came to see his parents—a noble motive, and probably a welcome visit to them if he was a steady youth, even though he may have needed to receive from them the money to come and go. Perhaps he wanted a wife; and if he was worth having as a husband, he could easily find a good one. Indeed, it is possible that, if he has gone back, he has taken with him the daughter or sister of some one of you farmers. If so, I hope he has got one of the best—"a real, genteel, well-informed, and pleasant-tempered and handsome wife," and one used to hard work, for she will find enough occasion for it at the West—a smart, noble, exemplary young woman,—

> "The fairest garden in her looks,—
> And in her mind the wisest books."

Perhaps the youth came to seek out a schoolmaster for the West, where schoolmasters occasionally die before their time, as victims of chivalry. Perhaps he wanted a minister, or an engineer, or an engine, or an invoice of shovels, or of clocks, or of medicines for fever and ague, or funds for a church, a college, a bank, or a railroad, where the money and the directors often run off faster than the cars. On either of these errands that young man may have come; and my hope was that, after he had stared the rocks and the mullein out of countenance, he might reason with himself thus: "If this soil has produced New England fathers and mothers, good wives, schoolmasters, churches, books, engines, and all sorts of notions, including myself, it must have some credit; and though I am too poor, or lazy, or ambitious to stay here, I shall always be proud to hail from it."

There is a robust strength of character, and a common-sense philosophy, and a healthful development of all the human faculties, to the production of which agriculture is more favorable than is any other occupation of life. If one should spend a week of familiar intercourse with a scholar, and another with a clear-headed farmer, he would be struck with the differences manifested between them at almost every point. In ruggedness and robustness of frame, in their bodily and nervous sensations, in the practical character of their information and in their views of life, they would stand distinguished. Even if they knew some of the same things in common, the different ways in which they have learned them would make their knowledge seem different. Our old farmers used to carry in their heads a vast deal of information of their own getting, which a young generation cannot carry in their heads though we take the trouble to put it into them in our schools. Our old farmers could stand in their fields, and, pointing off in all directions, —north, south, east, and west,—could tell you "the lay of the land," the boundaries of towns and states, the course of streams, the signs of the weather, and the fair promise of a crop. Our children have all this information given them in maps and books; but not one in twenty of them can impart it out of school. Such is the difference between having knowledge in your head or in your hands. Practical skill, ingenuity in devising makeshifts, the habit of making cautious calculations, the slow but safe wisdom that is matured, not in one season, but generally before the head is bald or whitened by the frosts of age,—these are the valuable talents of an intelligent farmer. Leave New England to the guidance of its old sterling principles, with the infusion from year to year of that wisdom which is left after the fermentation of old follies, and here shall be scenes of happiness for ages to come—of such happiness as the world any where is designed to afford—of such as the thoughtful know is alone good for them. And the hardest tasks on the hardest materials will still be found by the Creator's sovereign law to be the most rewarding. The richest and fairest spot of earth that lies on the whole twenty miles of road over which I travelled in riding here from my home this morning was, a few years ago, a foul and dreary bog. New England will yet find a use for every rock and cobble stone over all her fields. This is but a specimen piece of the whole condition of human existence, where we labor upon rough, and hard, and often condemned materials.

THE POSITION OF AGRICULTURE.

From an Address before the Middlesex South Society.

BY HON. I. H. WRIGHT.

The great interest of this country, beyond the power of man to change it, is agriculture. The climate, soil, tenure of the land, wants of the people, political institutions, hereditary pursuit, and relations to other countries, all combine to stamp the United States of America with the indelible character of an agricultural country. And most fortunate is it for this people that an all-wise Providence has thus cast their lot; for in this pursuit is found the greatest share of human happiness.

The health-giving, ennobling, and elevating influences of this employment have ever been the theme of wise and philanthropic men, and its beneficial results, in establishing the wealth, power, and true glory of a nation, as well the favorite topic of the political economist and statesman.

The growth and progress of the United States, from the time of the first settlement of the country by civilized man to the present day, is one of the most remarkable phenomena in the history of the human race. That a wild and rugged country, remote from the civilized world and overrun by fierce and warlike savages, should, within a period of time so brief as to require but little more than two centuries for its measure, become the happy home of nearly thirty millions of the human family, enjoying the blessings of civilization, reared in high moral and mental culture, governing themselves by wise and equitable laws of their own establishing, procuring an ample support from the moderate and beneficial exertion of their labor, and constituting a nation that ranks as an equal with the most powerful and older nations of the earth, while it exercises a wider and deeper influence upon the people of the old world than any of the nations of Europe—that such a country should thus, as it were, in a day in the life of nations, become the seat of a great and prosperous people, is truly among the wonderful occurrences in the history of the world. And yet agriculture has done all this for our country. Out of the bounteous soil have the materials been wrought which have built up the wealth and power of our country and ministered to the comfort and happiness of its people. True, the bravery and powers of endurance of our forefathers were exerted against the savage as well as the civilized foe in the foundation of this mighty empire and the establishment and defence of its free institutions; true, the busy hands of the artisan and the mechanic have turned the free mountain streams and subdued the fiery vapor to their use in the production of innumerable fabrics that conduce to the wealth and prosperity of the country; true, the busy marts of trade have drawn together from all parts of the land, as with magnet power, the productions of the soil and the fabrics of art, and the winged messengers of commerce have scattered them throughout the markets of the world, and freighted to our shores in return the riches of foreign climes; but, had not the soil been tilled, our forefathers would have had no country worth fighting for, the artisan and mechanic no food to sustain life, and no material upon which to bestow their ingenuity and labor, the trader no goods upon which to exercise his vocation of bringing about an exchange of products, and the ships of commerce no freights for foreign lands. So true is it that the agricultural interest of our land is the basis and support of every other interest, whether trade, manufactures, or commerce, and so dependent are they upon the prosperity of this great fundamental pursuit for their encouragement and success. We hear much said about the duty of government to foster trade, protect manufactures, and promote commerce; and it is well that government should direct its measures with reference to the benefit of these interests; for they are the handmaids of Agriculture, and render beneficial service in the use and dispensation of her products. But no action that will promote the real interests of agriculture can be otherwise than beneficial to trade, manufactures, and commerce; and, for this reason among others, the devotees of these pursuits should ever favor whatever government measures will promote those interests. That such is not the usual course of those engaged in other pursuits than those of agriculture is sufficiently apparent from the whole tenor of government action in this and other States and in the United States. While the statute books abound with acts designed for the promotion of trade and commerce and for the protection of manufactures,—acts that in their operation not unfrequently bear with severity upon the agricultural interest,—it is with extreme difficulty that any legislative action can be obtained calculated to benefit directly the cause of agricultural improvement.

The injustice and impolicy of such a niggardly course in reference to this paramount interest becomes still more apparent when we consider that, besides furnishing to a great degree the actual and substantial wealth and capital of the country, agriculture is the employment which engages more than three-fourths of the whole population of the country, and is the great reservoir of labor. Wise statesmen profess that it is the great duty of government to protect the labor of the country; that is, to secure to it employment and remunerating prices against the competition of labor in other countries. How better can this policy be carried out than by promoting the cause of agriculture, since that pursuit is the great employment of labor? If this interest is fostered and encouraged by government, the laborers engaged therein will thrive and benefit in proportion: their labor will be rendered lighter, their time spent to more profit, and the income of their labor enhanced. As agriculture is confessedly the great reservoir of labor, by the rise or fall of which all other labor is affected, and to some extent regulated, is it not, then, apparent that whatever benefits the labor employed in agriculture, whether it be legislative or social action, must produce a corresponding improvement in the condition of all other labor, however employed?

Of late years this great and all-important interest of agriculture has received more of the attention of prominent and influential men in our community than heretofore; and the direct consequence thereof has been the application of science to its operations to an extent never before known, and with the most beneficial results as to the improvement in the character of productions and the increase in the value thereof. The profound researches of the geologist have thus been made useful and productive of great pecuniary value, fully appreciable in dollars and cents, by indicating the origin and nature of soils, the component materials beneath the surface, and the sources from which deposits may be drawn to improve the character of land and render it better adapted to the use of the farmer. In this manner, also, have the great attainments of the chemist been made to subserve the interests of the farmer, by pointing out to him the cause and manner of those operations of Nature which result to his benefit or injury, and teaching him by what processes to promote the former and prevent the latter. So, too, has the learned lore of the meteorologist brought light out of darkness for the farmer, by giving him the fixed laws of Nature as his guide for seedtime and harvest instead of the charlatan predictions of almanacs or the wise saws of village oracles. And thus has the physiologist been made the willing and useful schoolmaster of the farmer, to teach him "the why and the wherefore," and the proper indicatives of good and of bad stock, and the sure modes of securing the one and of improving the other. The botanist, too, has contributed the results of his observations and minute researches into the hidden mysteries of Nature, and taught him the mode of the formation and growth of the plants which he rears, the materials which compose their structure, and the food which they require for their proper development. The entomologist has investigated for him the nature and habits of the insects which infest his grounds and destroy his crops, and instructed him in the way to render them innocuous, or to exterminate them. The ornithologist has studied into the habits and means of support of the birds which visit his fields, and, by pointing out those species that are a benefit to him and those which work him injury, corrected many a vulgar and injurious error respecting the operations of the winged inhabitants of the air, and taught him how to protect his crops and preserve them from depredation. Not the least among the votaries of science who have thus been enlisted as helpers to the farmer is the philosophical mechanic, who has displaced the rude and inefficient implements of agricultural labor by the admirable inventions which his profound researches into the doctrine of mechanical forces, his scientific tests of the strength and durability of materials, and his wise application of the laws of motion have enabled him to bring to the aid of the farmer. By this means have the plough, the reaper, and the rake been so much improved that work before impossible of accomplishment with remunerative returns has now become habitual with enterprising farmers, easy of performance, and highly profitable in its results.

The benefits thus secured to agriculture by the application of science are not to be disputed; there is nothing chimerical or even problematical about them; they are around us and about us, on every hand, and must be apparent to any man who has his eyes open, and sufficient power of memory to call to mind what he saw twenty years ago in the way of farms, agri cultural produce, and stock, and sufficient judgment to contrast that with what he now sees.

But the efforts of prominent and influential men do not stop here; they are not satisfied with what has been done in the way of agricultural improvement, nor yet with demonstrating that much more may be done. They are desirous to have the knowledge upon this subject which has already been obtained widely diffused over our whole country and put into general practice, and as many as possible of the strong, active, and inquiring minds of our farming population enlisted in the further pursuit of knowledge upon this important matter, that the means of developing and applying scientific truth may thus be greatly multiplied. They are therefore exerting their influence upon the public mind, and through that upon the government of the State, to the end that agricultural education may be furnished by means of suitable and adequate provisions for agricultural schools, where the practical sciences may be taught to the young farmers of our State, and their application to the processes of cultivation demonstrated and explained by actual experiments upon the soil. Is not this a wise and worthy object to strive for, eminently practical in its nature, and sure to be productive of the most important public benefit if carried out? Let us, then, all of us, old and young, humble or exalted, farmers, traders, mechanics, lawyers, doctors, or divines, whatever be our calling in life, give the full measure of our influence and active aid towards furthering the great and all-important object of establishing these schools in Massachusetts. United and vigorous action is necessary to accomplish what is desired; and the energetic pioneers who have gone forward in this good work should be promptly sustained by all good citizens. The underbrush of prejudice is to be cut away, the rocks of opposition are to be drilled by reason, blasted by conviction, and removed by patriotic public spirit, the yawning chasms of despondency to be bridged over by the sturdy tree of knowledge, and the road to success thus made broad and plain, so that this ancient and honorable Commonwealth may go forth in all the pride of conscious strength to the establishment of institutions which are to be for the benefit of the farmers who till her soil, which will adorn her farms with well-stored granaries, and make her waste places to blossom like the rose.

Truly a great work is yet to be accomplished in bringing about the application of science to agriculture; and in the judgment of wise men who have bestowed much thought upon the subject, and garnered up much valuable experience by the devotion of many hours of severe labor and the expenditure of much money, this great work can be best accomplished by the establishment of public schools for agricultural education. That this enterprise is not a hopeless one is demonstrated to some extent by the action of the last Legislature in the appropriation of a portion of the State lands at the Westboro' Reform School to the experimental uses of scientific agriculture, and the assignment of the sum of six thousand dollars from the State treasury to the same object—the whole to be under the direction of the Massachusetts Board of Agriculture. The aid thus given by the State towards this object is small indeed compared with the magnitude of the object and the importance of the results sought for to the wealth and prosperity of the State. But still it is a beginning in the right direction, and therefore a cause of hope to the advocates of agricultural education; and if the aid thus furnished by the State be wisely improved, as we cannot doubt that it will be, under the supervision of the State Board of Agriculture, the successful results which even this limited effort in behalf of scientific cultivation will produce will have a powerful effect in demonstrating the soundness of that policy which would provide the whole State with adequate institutions for the instruction of our youth in all those arts and sciences which are essential to improvement in the business of agriculture. Let us, then, hope for a happy issue for this first experiment of our Commonwealth in the application of science to agriculture, and press on in the good work of advocating the adoption of that policy which, while it would enrich the minds of our young men with the best kind of practical knowledge, would at the same time increase by many fold the valuable productions of the soil, and thereby add greatly to the wealth and power of the State.

THE MASSACHUSETTS FARMER.

From an Address before the Worcester Society.

BY HON. EMORY WASHBURN.

While I would speak of the condition of the farmer of Massachusetts as it is, and of what should be done to improve it, I propose to call your attention to what I regard as the two great sources of discontent on his part, growing out of indulging the habit of contrasting and comparing his condition with that of others: first, in respect to the corresponding classes at the South and West; and, second, in respect to those engaged in other pursuits at home.

If we turn our attention for a moment to the attractions which the South or West hold out to the farmers of New England, I am far from admitting that he acts wisely who abandons a comfortable home here in the hope of finding a better or an easier one there. Grant that he would have a richer soil from which to reap a more abundant harvest, at a far less amount of labor, in that region which promises to be the granary of the world, than here; grant that its progress in wealth and population is outrunning the calculation of the wildest dreamer, and that upon the millions that are gathering there depend the future destinies of our country; grant, even, that from the surplus population of the North there will eventually grow up along the rich prairies of the West peaceful and prosperous communities, in which New England sentiments and New England habits may stamp a New England character upon the people of that region. I am far from seeing in any or all this a cause for envy or discontent on the part of the owner of a snug farm in the county of Worcester.

I speak not, of course, of what lies far down the vista of future generations, but of our own—of institutions and privileges which are now enjoyed. And in this view I see little to tempt the farmer of New England to exchange what he has here for a something which he hopes to enjoy elsewhere hereafter.

The crowning glory of New England is her institutions and the moral and social influences which they exert. And these, it should be remembered, are the growth and development of two centuries—rendering her unsurpassed, as a moral, intelligent, and independent community, by any other on the globe. And what does a man gain in exchange for these in the new regions to which he is invited? what for the schools, the churches, the public libraries, the good neighborhood, the good roads, the mills, the workshops, the health that nerves his arm, and the neatness and comfort with which he is surrounded here? Harvests whose very abundance impoverishes the owner by depressing prices in the distant markets to which he must look for a return for his labor; a population almost necessarily too sparse to share adequately in the benefits of schools, collected from every quarter of the globe, which a century will hardly assimilate or reduce to a common tone of sympathy or feeling; disease in its various forms lurking unseen, and scattering its subtile poison along some of the richest valleys and through the most tempting portions of that fertile region; while the means of moral and intellectual culture of the young are necessarily limited, and the temptations to ease and indolence must be always such as a feasible and fertile soil never fails to hold out to the farmer who tills it. These are some of the incidents which must for years, and perhaps generations, attend the sacrifice of a New England home for the chance of raising a larger crop of corn or wheat than ordinarily waves along the furrows of a New England farm.

There is, however, one spot in that region which holds out to the true-hearted man of the North attractions beyond the teeming harvests with which a virgin soil allures the emigrant, not in the ease which he is to earn there, but in the deeds which he is to do. I refer to that spot now memorable in the history of political affairs, once consecrated to Freedom, but now to be desecrated by the accursed institution of Slavery unless preoccupied by the homes and institutions of freemen.

To such as are willing to give up the priceless blessings which New England offers, to go forth and plant a race of freemen there, there is not a heart that ever felt one glow of generous enthusiasm that does not bid them God speed in their enterprise. Let them go; let them by their presence turn that wretched blunder of slave propagandism into a barren triumph; and when in after ages that beautiful region shall be teeming with its millions of freemen, the memory of these pioneers of Freedom will be dear to a grateful nation.

I had thought of speaking of the sunny South, and the attractions it holds out to those whose energies have been fed and nursed by the winter storms that sweep along these rugged hill tops; but the fascinations that may have once tempted, the love of ease and the hope of wealth, which are common to all men, to such a land of promise, where the magnolia towers in its beauty and the orange groves load the air with their fragrance, have been growing weaker and weaker as the character of her "peculiar institution" has become better understood by the people of the free States. To say nothing of its moral and political effect, its influence upon the character of labor is enough to render it odious if tried only by the test of political economy.

Labor has been made by Providence the law of man's condition; it is the price at which whatever is valuable in life must be earned; and yet, though originally pronounced as a curse, it becomes, under proper regulations, the surest source of positive blessings to man. In whatever field of honest effort it is exercised, it brings with it, as its reward, the self-respect of the laborer, as well as the respect of all true men with whom he is associated.

Whatever, therefore, degrades labor as the business of life, or renders it distasteful or dishonorable, does violence to our social laws no less than to a wise economy. If the labor of a community is thrown, as a burden, upon a degraded class,—be it the helots of Sparta, the slaves of Rome, or the slaves of the Carolinas,—it becomes in itself a degraded pursuit, till the masses of the community grow luxurious and corrupt, or idle and degraded, themselves. They may boast of their chivalry and pure blood; but the chivalry and blood of such a people grow weaker and less pure together, till redemption comes, if it come at all, in some form that restores to labor its true dignity and influence. It may be by revolution, or it may be, as we trust it will be in our land, by the conviction forced at last upon the universal mind of a nation that slavery as an institution is no less hostile to the development of the physical powers of a people than it is to the dictates of a common humanity.

However tempting, therefore, may be the cities and villages of the South as marts of trade for our young men, there are fewer attractions every year for our farmers of the North in the cotton fields or rice plantations, where the white man is ashamed to toil, and the unrequited labor of the black man is wrung from reluctant sinews by the terrors of the lash.

There is one other comparison which the farmer of Massachusetts is apt to make, which creates a competition with his own chance of happiness stronger than any I have mentioned; it affects him not only individually, but enters into his social relations, and shapes in no slight degree the education and prospects of his children; and that is, the comparison which is made between the business and position of agriculture as a pursuit and the various other callings and pursuits into which the people of New England are divided. It is the farthest from my intention to speak disparagingly of the honest pursuit of any man; and my object is, to ask the farmer to pause a moment and look calmly at both sides of the picture which the varied life of industry in New England presents before he is ready to forego the certain sources of independence which he enjoys for the fancied advantages which others possess.

Men judge too often from outside appearances. The bright and yellow metal that so many are striving to grasp does not always turn out to be gold. The grand house and beautiful garden may serve as a pretty toy to the man of trade or commerce on which to expend the surplus of his fortunate gains, and his fancy may be tickled with the idea of possessing what others shall envy or admire so long as he is building or perfecting it; but when he has gained the object of his life, and grown familiar with the pet of his riper childhood, he finds too often that one does not always exchange a life of toil for one of happiness with ease.

The great difficulty in the way of a farmer's contentment is, that, while he toils for a respectable independence, his gains are necessarily somewhat slow in their accumulation, and he is too ready to assume that those who put on the outside marks of competency are, in fact, more successful and more favored by Fortune than himself. He allows himself to be led away by that haste to be rich with which so many are infatuated.

He sees, perhaps, the merchant, the professional man, or the speculator dressing in the style of a gentleman of fortune, living in a showy house, or sharing more liberally than he in what the world calls its honors, and he looks for some similar chance for success in life for his children instead of training them up to his own pursuit, though a hundred times more certain of ultimate success. His great mistake consists in confining his observation to the fortunate experience of a few individuals instead of regarding the history of these employments as classes. Of the many who enter these walks of life, he does not stop to inquire how many fail; how few, compared with the farmers as a class, attain to even a comfortable independence. The instance of an industrious farmer becoming bankrupt is a rare phenomenon; but for him to want the means of giving his wife and children the real comforts of life, and of fitting the latter by education for any ordinary position in life to which they may aspire, is still more rare in Massachusetts.

The statistics of success in life in the various callings and pursuits in which men engage would furnish a curious study for speculation if they could be accurately reached.

At one of our legislative agricultural meetings, a few years since, some statements were made upon this subject which will serve to illustrate what I have said. "Of all the merchants," said one of the speakers, "who have done business on a certain wharf in this city (of Boston) within forty years, only six per cent. have become independent: the remainder failed, or died destitute of property. Of one thousand merchants with whom accounts had been opened at one of our principal banks, within the last forty years, only six of the number were ascertained to have become independent." Another highly-intelligent gentleman, from our own county, who had been both a merchant and farmer, stated "that from actual investigation it had been estimated that in every hundred traders but seven succeed in acquiring wealth."

Of eleven hundred and twelve bankrupts who took the benefit of that law in Massachusetts, he stated that only fourteen were farmers; and of twenty-five hundred and fifty bankrupts in New York, only forty-six were farmers.

And when I turn to the personal history of my own profession in this county, it is painful to recall the number who, within the limits of my own memory, have toiled through life in a constant struggle to sustain an appearance which public opinion imposed upon them, and left, at last, little else as an inheritance for their children than the name which they had striven to preserve from oblivion.

And in respect to one other of the professions, I apprehend the language of one of the earliest and most distinguished of their number might be borrowed in respect to the acquisition of wealth: "If in this life only they have hope, they are of all men most miserable."

What I mean by these remarks is, that the man who allows himself to be dazzled by the brilliant success of another in some different calling from his own, and is thereby led to indulge in feelings of discontent, acts against the light of reason and experience; and, above all, that the farmer who yields to such a weakness overlooks altogether the means of independence which lie within his grasp.

Nor do I in this measure life by mere worldly goods—by tons of hay, or bushels of grain, or heads of cattle. I do not test its value by a reference to the books of the assessors to ascertain the actual value of the acres he may own, or the amount of money for which he may pay taxes. I take a young man, as I find most of our farmers' sons in New England, carefully trained in morals, well taught in the rudiments of knowledge at our free schools, and his common sense sharpened by the very expedients to which his parents may have been obliged to resort in bringing up a large family upon the income of a little farm, and I send him into the world with nothing, if you please, but his hands and a hopeful heart; and with these he is to win his way in the world. He finds labor honorable and well rewarded; he finds in an old community like ours accumulated wealth that is ready to seek investment; he finds men wise enough to prefer the security which a young man offers, in his manly frame, industrious habits, and good morals, to the venturesome speculator or artful schemer; and by the aid of these he is soon able to become the most independent of created beings—a young, hopeful master of his own acres, with a roof to shelter himself and the wife who in the confidence of woman's love has joyfully embarked with him on the ocean of life.

It is not indeed to the spot where he plants himself that he owes this sense of independence which he feels. He may enjoy it here; he cannot lose it altogether, let his home be ever so remote. It springs up within him from the seed that is sown and the germ that starts in the home of his childhood. Who, while travelling through the great West for instance, on stopping at the hospitable door of a farmer, has been told, in answer to his inquiry, with that ready alacrity that marks a generous pride in giving it utterance, that its master had emigrated from the county of Worcester, has not seen stamped upon every thing around that farm house something to mark the origin of its owner? Years may have passed away; his name may have been forgotten in his native village; but in and around that western home which he has planted for himself there will be that which a practised eye cannot mistake; and the trees that shelter it, the school house by the roadside, and the modest church in the distance that marks where a village is clustering, are but counterparts to the features in the landscape on which his young senses first opened.

And yet these are not the fruits of the wealth he carried out from the paternal roof, but of the training of his boyhood, of the school house where he studied his arithmetic, and the church where he sat by his mother's side and heard the solemn but often rugged truths that settled deep in his memory, and sometimes more deep from the very struggle which his own young will held with such sturdy dogmas. Such men are independent where they are; but they would have been no less independent had they never left the soil of New England.

THE ECONOMY OF SCIENTIFIC AGRICULTURE.

From an Address before the Hampshire Society.

BY REV. W. CLIFT.

In calling your attention to the economy of scientific agriculture, it is hardly necessary to remark that the science of this art is yet in its infancy, if, indeed, it can be said to be born. Very few cultivators are able to give a reason for the faith that is in them; and the most enlightened of the calling are generally most cautious in assigning the causes of the facts that come to light in their art. Yet there are certain principles of great practical value, so far established as to be safe guides, that ought to be every where disseminated. The tiller of the soil should know, so far as he can, the causes of those beautiful processes in Nature on which success in his art depends.

It has been often asked, "What is the use of educating a boy who is to till the soil? He is going to be nothing but a farmer." And the question shows both a low estimate of the occupation and of the qualifications for it. "Can he lift a bigger stone, or lay a smoother furrow, or drive a team any the better for his learning?" Though it be somewhat heretical, I venture the opinion, that an educated farmer can do the most common farm work all the better for his education. It is mind, enlightened by science and disciplined by the study of the schools, that has given us all the improvements in the implements of husbandry and in the methods of culture that we now enjoy.

What is meant, then, by a scientific farmer? I do not mean simply a bookworm, who has gone through the routine of college studies. The discipline of college is desirable, if a man would make the most of himself, in any calling; and, were I shaping my own course for this occupation, I would not forego this discipline if it were within my reach. But this is not necessary that science may bring its blessings to every farm.

Nor is a scientific farmer necessarily a man of wealth and intelligence, retired from professional life, or some other calling, to amuse himself in rural occupations. There are such men, wise in other things, but sciolists in the cultivation of the earth, who spend a hundred dollars to get a crop worth fifty from the soil. They are generally the laughing stock of all common-sense farmers in their neighborhood, and are thought to be a standing refutation of the utility of book farming. But this argument is not fair. Agriculture is not their business, but their amusement, and they do not conduct their operations at all with reference to profit. No farmer understands the science of his business until he sees his way clear to get back every dollar of capital that he expends upon his soil, with a large increase. He is a man who understands both the science and the practical details of every operation upon the farm. He can tell you, not only why a thing should be done in a given way, and how to do it, but he can do it himself. He is a sceptic as to the wisdom of his grandfather, and believes that even all agricultural knowledge did not die with his father. He is a man who knows something about his business, and looks for new revelations in the future.

The man of science upon the farm, in the first place, knows something of the composition of his soils. These are the materials on which he is to display his skill, and out of which he is to rear his harvests. There is a great difference in these; and, without a proper knowledge of their ingredients, he cannot tell how to grow a crop to good advantage. It is all a matter of experiment whether or not he have a remunerative harvest. Without this knowledge, too, he is unable to tell what amendments his soils require, even when the chemist has made an analysis of them. A farmer who does not understand this is as poorly fitted for his business as the smith would be who did not comprehend the different qualities of metals, or the carpenter who could not tell the difference between white oak and white pine. The mechanic who should give you a pine plough beam or a chestnut axe helve would be called a bungler or a knave. And yet his case would be parallel with that of the farmer who attempts a grain crop on a field that has lost its potash or its phosphoric acid. The folly, in either case, is transparent. You have the form and semblance of strength in the pine plough beam, but no toughness or durability. You have the stalks and the heads of the wheat or the rye, but no grain. Both are shams, because bunglers have made them. In the case of the grain crop the blame is thrown upon Nature, and it is declared that the wheat blasted. The poor man does not suspect himself of a vain endeavor to rival the Almighty—to make something out of nothing; and yet that is practically the policy of the farmer who would grow a crop without knowing whether the elements of that crop are in his soil.

There is a direct pecuniary benefit to society in scientific agriculture. It would bring cheaper food, and of much better quality, to every man's door. In the absence of famine, we forget that famine would now exist were it not for the improvement already effected by the application of science to agriculture. It is this alone which has enabled England to double her population within a century. It is this alone which enables us to keep so much of our population upon the sea board, and which can keep it against the strong competition of the new lands of the West.

What science has done for British agriculture it can do for ours. There is no magic in great crops, and no miracles wrought in God's rain and sunshine. "He sendeth his rain upon the just and upon the unjust." The man who knows how to make his acres produce maximum crops will get them, and he only. Providence will help those who learn how to help themselves. There is a wide difference between good and bad husbandry, visible to all who look at it. There is a still greater difference between that which now prevails and that which is attainable by all.

It is speaking far within bounds to say that the present agricultural population of Hampshire County is capable of producing from the same farms now cultivated twice the amount of meat and breadstuffs now grown here. Many a farm, under improved husbandry, has increased its productions three and fourfold. But suppose the products of this county are only doubled by this process. The result is a gain to every member of the community who consumes these products. The butter, cheese, beef, pork, and lard which enter into the yearly bills of every family would be furnished a little cheaper. The vast quantities of flour and grain which now come to you from the West might just as well be raised at your own doors and be furnished at a cheaper rate. All these articles are increasing in price from year to year mainly because consumers increase faster than the agricultural skill of our farmers. Farmers here have long since ceased to supply eastern markets; and we have to import the deficiency from abroad, and pay a profit to the shippers and merchants, who stand between us and our producers. There is no remedy for this high price of provisions but in a more skilful cultivation of the earth. This, then, clearly, would be a direct pecuniary advantage to all classes in society.

BRITISH AND AMERICAN AGRICULTURE.

From an Address before the Hampden Society.

BY PROF. J. A. NASH.

To be particular, and to make the subject as practical as possible, I will refer you to some practices of British agriculture which are to be avoided by us because wrong in themselves; to others which, although they may be right in that soil and climate, are to be avoided because they would be wrong in ours; and to others still which are right under all circumstances, and so should be carefully copied into our husbandry. In speaking on these topics I may as well pursue the order of Nature. The farmer begins with his soils and manures; he proceeds with his crops; and he ends with his beef, pork, butter, cheese, and other marketable products. I will pursue a like order with the few topics on which the remaining time will permit me to speak.

With regard to soils,—their neat, cleanly cultivation, and their appropriation to this or that rotation of crops, as they are found by experience to be better adapted to one or another,—the farmers of Great Britain are, as might well be expected, in advance of us. There it is pretty generally understood, not only for what course of cropping each district, but every farm in each district, is best suited. Some lands, for instance, have come, by accumulated experience, to be regarded as more profitable for perpetual pasturage than for any thing else. Of these some are devoted almost exclusively to the fattening of beef, others to dairy purposes, and others to sheep culture. It is not that these lands are unfit for the plough. Some of them, many even, very large tracts, are the most beautiful lands I have ever seen. They would very soon feel the plough but for the settled conviction that such is their aptitude for producing the natural grasses that they are worth more for that than for any thing else. So it is with lands for cultivation. Some are found to be such, that, with a given manuring, not very expensive, they alternate wheat and clover perpetually, and are worth more for that severe rotation than for any other purpose. Others cannot, by any reasonable expense of manure, produce continually such exhausting crops. They are more profitably subjected to a rotation of three years, giving one crop of wheat in that time, and requiring but light crops the intervening years. Other lands, still lighter, are more profitably subjected to a four-years' rotation, others to a five-years' course, and others to one of six years, giving wheat but once in those times respectively. The farmers of those islands have studied the fitness of their soils for this, that, or the other purpose; they have studied it with reference to the nearness or distance of markets; and they have studied it with reference to the natural fertilizers obtainable in each locality. In Cornwall there is a large tract of land worth fifty dollars a year for raising potatoes. It bears two large crops of potatoes each year; has borne nothing else these many years past; and probably will bear nothing else for many years to come. The reasons of this are, that on one side of that land is an ample market for all the potatoes that can be grown upon it, and on the other side is a kind of shell sand, so adapted to this soil that a dressing of it each year is found to make the land produce great crops of potatoes twice a year, without being itself exhausted, and without diminution of the crop. British husbandry is doing much towards turning each acre to the best possible account. It is no disgrace to us that our husbandry is not yet as acute and far-seeing. Hitherto there have been good reasons for our being behind in this matter. But these reasons will not last always. We should not too much blame our fathers if they did as their fathers did before them without asking why; but if our children should do as we are doing, let us hope at least that they will have a good reason for it. Let us study our soils; let us ascertain for what each is best suited; and, as far as possible, let us put each acre to the best use.

In Great Britain, as in our own country, but far more inexcusable there than here, you see considerable careless, slipshod cultivation. You see poor implements, poor teams, the work slatternly done, every thing of a cast that you could not commend. You see also there, as here, a better species of cultivation, in which the farmer is neat, is industrious, does every thing in a way which would have been up with the beginning, but is not up with the middle, of the nineteenth century. You could not commend this to our imitation. Why should not the farmer, whose profession is sufficiently laborious and not too lucrative, avail himself of the very latest improvements? Especially now, when thought, inquiry, intellect are brought to bear on his employment, should the farmer be up with the times.

But aside from that careless, slovenly farming, which was never fit for any age, and that listless, uninquiring course, which, to say the least, is unfit for the noon of the nineteenth century, there is a great deal of the cultivation of the soil in Great Britain which you would admire. The land is ploughed deeply—so deeply as to afford all but an absolute guaranty against injury from too much or too little rain; it is so pulverized as to furnish an almost perfect seed bed; the manure, if not put in the drill, is so perfectly mixed with the whole body of the soil that no root or rootlet need go out of its way in search of food. I am aware that, in consequence of the dearness of labor, it may not be wise, in many cases, for us to cultivate with the same nicety that some Englishmen and Scotchmen do; but certainly the time has come for us to inquire whether good cultivation, even at "a dollar a day and found," is not more profitable than running haphazard over the ground and doing nothing as it should be done.

Hardly any thing in the farmer's calendar is so important as the management of manures. I have been into barns in England where the air was so completely charged with ammonia that its effect on the olfactory nerves was like that of Scotch snuff. Its effect on the eyes was enough to make the hardest-hearted man in the world weep living tears. If some of the real Scotch yellow were to blow into the eyes, it would hardly produce a more speedy lachrymation. I have been into other barns, where scarcely an offensive odor could be detected. Now, what made the difference? The barns were tight in both cases; they were not very well ventilated in either; but in one case nothing had been done to prevent the waste of manure and the injury to the eyes and general health of the animals. In the other case, a little swamp mud, a few shovelfuls of clay loam, some powdered charcoal, a few pounds of plaster, or a little copperas dissolved in water, whichever had been most easily obtained in the place, had been daily thrown in; a process of composting had been attended to simultaneously with the deposition of the manure; the whole had been kept sufficiently moist to prevent any violent fermentation; and the consequence was, that the manure in and about these barns was much more valuable than at the others, and the cattle could not fail of doing better.

Again: I have seen in that country barn yards sloping down to a run of water which by its color I could plainly see was carrying off the soluble salts of the yard. A little variation in the surface of the yard, making the middle the lowest, would have completely prevented the waste. I have seen other yards so arranged that it was clear that immense quantities of manure were there composted, and partially fermented and fitted for the soil, without the waste of a particle.

It may be said that these are small matters—hardly worth bestowing thought or attention upon. It is not so. The difference of result between the good and bad management of manures on a farm of one hundred acres is all of one hundred dollars a year. Let one farmer of a hundred acres manage well in this respect, and let his neighbor on a similar farm manage badly in the same respect, and at the end of thirty years, other things being equal, there will be a wide difference between them. The crops of the one will be in the ascending, those of the other in the descending, scale; and while the farm of one will be constantly increasing in value, that of the other will be diminishing, or but hardly holding its own. Wastefulness in the management of the farm fertilizers is one of the greatest obstacles to prosperous farming. Many a farmer has come out badly, who, if he had corrected a fault here thirty years before, would have come out well.

A scrap of Grecian literature has come down to us, which relates that a wine cask, which had been filled to the brim, was found partially empty. A bystander suggested that an examination be made, to see if there were not a leak at the bottom;

whereupon a scholasticus, which, according to my best recollection of Greek, means a dandy, gave it as his opinion that the leak could not be at the bottom, for it was not the lower, but the upper, part of the cask that was empty. If the boys in those times used straws in the wine casks, as we have known them to in cider barrels since, he may have been right in supposing that the leak was at the top; for in that case the cask may have leaked upward. At any rate, a manure heap, left in sun, wind, and rain to its own course, will leak upward, and downward, and all around till nearly half its value, like the upper part of the wine cask, is found wanting.

With regard to the sewage of cities and large towns, it is rather the fault of the British government than of British farmers that it is in a great measure lost to agriculture. It is not wholly lost; that cannot be; for there is a government above all human government; and God has ordained physical laws by which the errors of man are sometimes counteracted. Such is the case with the sewage of English cities. So far as human agency goes it is permitted to flow into large rivers, and thence into the ocean; but here the divine laws take effect, and, in spite of man's error, they restore a portion, it may be one-half of it, to the land. Some of it comes back in the form of spray driven landwards from the ocean; some in the form of fish, which is made directly or indirectly to enrich the ground; much in the form of shells, which are burned into lime for the soil; and more in the form of seaweed, shell sand, and other fertilizers along the shore. But, after all, a considerable portion of it, not less probably than half, is irrecoverably lost to agriculture. And now let us see what the extent of the loss is.

When a farmer who provides for a large family, and feeds a great stock, sees his sink spout always running, and the suds often pouring from his laundry, he calculates that by the end of the year there will be accumulated on his premises a large amount of fertilizing materials for his fields. But the population of London is two and a half millions—about one-twelfth of the population of the United Kingdom, and equal to two hundred and fifty thousand families of ten persons each. They consume twenty million bushels of wheat annually, besides other cereals. There is, of course, a proportionate consumption of meats, groceries, fruits, and vegetables. As milk is required, large dairies are kept in and about the city; and the number of horses that are kept either for business or pleasure is very great. All this, you perceive, implies a large consumption of farm produce. But, with the exception of solid manures from the dairies and liveries and of a part of the street sweepings, the whole sewage of this immense city flows into the Thames. It has been said that an equivalent for the elements of a hundred million bushels wheat are here ingulfed annually; and such is the dark, dense turbidness of the Thames, that you would be ready to believe the estimate. But suppose that no more than half as much guano flows into the Thames, and that one-half of this finds its way back by the operation of those higher laws before alluded to; even then an equivalent for twenty-five million bushels of wheat—something which would increase the wheat crop of Great Britain to that extent if incorporated with the soil—is lost to the agriculture of the United Kingdom. If to this be added the wastes of a hundred smaller cities and towns, the amount is enormous.

It is different with the cities of the European continent. France is wiser in this respect. The cleanliness of the Seine is in striking contrast with the filthiness of the Thames. France suffers but little of the fertilizing elements of her cities to be washed away in her rivers, and Belgium literally nothing. Her rivers, though small, are hardly strained in passing through a city of a hundred thousand people. Nothing is tolerated in the streets of Belgian cities which could by possibility fertilize a foot of ground in the country. But England expends millions for Peruvian guano, and suffers scores of millions' worth of like materials to pollute her rivers. We, being yet in our infancy, and having a virgin West to fall back upon, are more excusable; but the time will come, if it has not come already, when it will be far wiser for us to withhold the sewage of our eastern cities from the Atlantic Ocean than to send our ships round Cape Horn for guano; and when this is done, there cannot be the least doubt that the agriculture of these Atlantic States will be prosperous. Our farmers are now paying twelve millions a year for guano. If one-half as much could be expended in wisely-conducted measures for saving and rendering portable the sewage of our cities, a far greater return would be received.

British farmers do not generally work with their own hands. There are gardeners, and there are some small farmers, who do all their own work; but, as a general rule, farmers of a hundred acres or more seldom handle a tool. They are all over their premises, sometimes on foot, sometimes on horseback, and very often on a pony so small that they seem practising to ride and go on foot at the same time. They think that the transaction of the general business and the oversight of the labor are enough for one man. It might be asked why they should do more in a country where labor is so plenty. Why should the farmer plough, hoe, and mow, when there are so many who desire that work, even at the small pay there given? If he could get a comfortable living without labor, it would almost seem as if charity would require him to withhold his hand in favor of those who cannot. There are those about him who would call him a niggard if they were to see him doing jobs for which they feel that he ought to pay them. Such is the state of things there. May it long be otherwise here; long may labor be regarded honorable for all; and long may those who labor for wages receive a reasonable compensation. But I have thought that some American farmers run into an opposite extreme—do as much work as they would require of a hired man, and then have as much more to do in the way of business, oversight, and nameless matters of economy, which hired men do not trouble themselves about. This may be an error that leans to virtue's side; but it is an error still; for no man can long pursue such a course without seriously injuring himself.

Under-draining is a point on which British and American practice most differ. Owing to climatic differences, certain qualities of land may be benefited by draining there, while the same quality could not profitably be drained here. Soils there, from the most clayey, up through the various loams, to the most sandy, are more compact than those which bear the same name among us. There is no doubt that lands from which the surface and the sub-surface water does not pass downward freely need draining. It is hardly possible to over-estimate the importance of draining such lands. There are lands in western New York, either of a clay soil or having a more porous soil resting on a clay subsoil, which are worth little without draining, but are of great value when thorough-drained. There are such in other parts of New York; and there are here and there such lands in New England—lands which must be drained in order to be of much use. But these are the exceptions, and not the general rule. In Great Britain the reverse is true. The general rule is, that lands are improved by draining; and the exceptions are of lands not benefited by it. Some there have gone so far as to say that there are no exceptions—that all lands are improved by draining, even the dryest. But never was a more nonsensical doctrine put forth. It is sufficiently absurd when applied to that country, and is so regarded by the best farmers there, but ten times more absurd in its application to this country. I have often described our most common qualities of New England soils and subsoils to English farmers, and asked what would be the effect of draining such land; and I have received for reply, that it would but lose to the owner all the money expended in the operation. The truth is, that land which, owing to a too retentive surface soil or an impervious subsoil, does not pass the water readily through it, is greatly benefited by draining; but it is true, also, that most of our New England farms are naturally drained in the best possible manner. In other words, the Almighty has done this work so well that the owners need expend nothing with the hope of doing it better. To be, as some are, always prating about draining our ordinary uplands, is just about as reasonable as the raving of a man in the delirium tremens about pulling off the snakes, since it is as true that there is no excess of water to be got rid of in one case as it is that there are no snakes to be pulled off in the other.

McCulloch sets down the fallows of Great Britain at two million of acres. The summer fallowing of land is another practice which may be well enough for English farmers, but cannot, except to a very limited extent, be well for American. In our dry climate we can hardly conceive how difficult it is, how almost impossible, by any other means, to keep their fields from grass and weeds. In addition to this, their soil, being cooler and more compact than ours, by reason of frequent rains, parts with its organic matter less readily; so that, however wise the practice of summer fallowing may be there, it can hardly be wise here, unless in case of our heaviest and most clayey lands.

British farmers raise turnips in immense quantities. Their patches of turnips and rape cover annually five million of acres —a territory of the size of Massachusetts. I have no means of knowing what proportion of this is covered with turnips. It may be three million of acres. As you traverse their country you see turnips before, and behind, and on every side. One who has not witnessed it can hardly realize the extent and beauty of their turnip fields. The cultivation in many parts, and especially in Scotland, is exquisitely nice. It has seemed to me as if there was but one weed on a thousand acres, and as if there were as many as three women and half a dozen children after that one.

The turnip culture is the true policy for our British brethren. They need the turnip both for purposes of feeding and to make out the rotation by which the ground is to be prepared for the wheat crop. We have no special need of it for either of these purposes. Besides, their climate is probably the best in the world for the turnip; ours is perhaps the worst. Still it may be that we ought to cultivate the turnip more than we do. I wish every farmer would try the experiment for himself. A single acre is as good for the trial as more. Let it then be made; let it be repeated; let results be compared; and if we are to go into the turnip culture to some limited extent, as I think it highly probable may be found wise, let it be from proof positive, gathered on our own soil, that such is our true policy.

It is an important fact that Indian corn is a most valuable crop for all feeding purposes. Our English brethren are slow, almost provokingly slow, to learn its worth. They seem to think it fit only for lean pigs and starving Irishmen. If they could grow it as we can, and then could get their eyes open to its value, you would hear very little crowing over their turnips; and on the other hand, so long as we can grow it with almost entire certainty, failing less than once in a quarter of a century, we need not much regret if the growing of turnips should be found relatively less important for us than for them.

The farmers in Great Britain, for the most part, build no barns, according to our understanding of the terms. Their barns are small—mere stables—wholly inadequate to contain the produce of the farm. However, you every where find great stacks of hay, and large ricks of wheat, barley, oats, and beans, surrounding their cattle yards. In their climate, and especially as lumber is scarce and high, this may be good policy for them; but it would be miserable economy for us. With them the farm house is generally the largest building on the premises; with us the barn, in nine cases out of ten, is larger. This is as it should be. It is well for us to build our farm houses snug and cosy—concentrating in them and gathering about them every possible comfort. Let them be as neat and as tasteful as possible. Their very aspect should proclaim that no one has a better right to live in a style of rural elegance than the farmer. But, our winters being long and cold, and lumber being here comparatively cheap, it is our true policy to build our barns sufficiently large to contain all the produce of the farm, with plenty of stable room, having a cellar under the whole—the cellar to be open on the sunny side, and to form a part of a capacious and warmly-enclosed yard. We should make them labor-saving and manure-preserving—studying that construction which will render the stowing of produce, the feeding of cattle, and the preservation of manures as easy and as light as possible. Whatever English books may teach or English practice commend, the New England farmer who does not provide himself with such a barn runs against his own interest and sets a bad example to his neighbors. He makes farming a needlessly up-hill business.

THE DEMANDS OF AGRICULTURE.

From an Address before the Berkshire Society.

BY HON. INCREASE SUMNER.

Our farmers seem too much to act upon the erroneous and hurtful principle, that the fertilizing capacities of the ground are all self-creating. The great fact, true beyond all contradiction, that every crop harvested from the field takes from that field forever a portion of its fertilizing properties, is a fact not theoretically appreciated, and practically it is disregarded. For the abstraction of these properties, thus made, restitution is demanded. The demand is unheeded; and impoverishment and sterility are the results. Let us view these results. Take Massachusetts. She has an area of seven thousand two hundred and fifty square miles. The facts imbodied in a resolve of our Board of Agriculture will be all that is needed in this connection. Referring to the Report of the Valuation Committee to the Legislature in 1851, the resolve states that "it will be seen that, although there have been added to the lands under improvement since 1840 more than three hundred thousand acres, and although the uplands and other mowing lands have been increased more than ninety thousand acres, or nearly fifteen per cent., yet the hay crops have increased only three per cent.—showing a relative depreciation of twelve per cent.; and although the tillage lands have been increased more than forty thousand acres in the same period, yet there has been no increase in grain crops, but an absolute depreciation of *six hundred thousand bushels;* and although the pasturing lands have been increased more than one hundred thousand acres, yet there has been scarcely any augmentation of neat cattle; while in sheep there has been a reduction of more than one hundred and sixty thousand, and in swine more than seventeen thousand." And upon these premises the Board justly urge the necessity of *agricultural education.*

Let us examine the State of New York, with her area of forty-six thousand square miles. In that State, in 1845, there were under improvement eleven million seven hundred and thirty-seven thousand nine hundred and sixty-eight acres; in 1850, twelve million four hundred and eight thousand nine hundred and sixty-eight acres—making a gain in five years of six hundred and seventy-one thousand six hundred and ninety-two acres. With uniformness of fertility during these years, all vegetable and animal productions should have gained proportionally with the increased area of cultivation. Allowing the seasons of 1845 and 1850 to be equally favorable, if a greater amount of productions were yielded per acre in 1850 than in 1845, this would prove an enhanced productiveness; but if the productions were less per acre, then the inference is that the land must have parted with more of its fertilizing properties than it regained.

The following is a statement of the decrease of crops and animals, comparing 1850 with 1845:—

Potatoes, 7,255,056 bushels; pease and beans, 1,182,054 bushels; flax, 1,956,485 pounds; wool, 3,793,527 pounds; wheat, 270,724 bushels; buckwheat, 450,724 bushels. In regard to animals, they diminished in numbers in the above years thus: Horses, 58,141; cows, 68,066; other cattle, 127,525; swine, 566,092; sheep, 2,990,624. There was an increase in the crops of corn, rye, oats, and barley, falling greatly short, however, of the proportionate requirement.*

If we were to extend our examination throughout the Northern and Middle States, results not more flattering than those adduced would be discovered.

The facts in regard to agricultural improvement in our Southern States are not more gratifying. But on this subject let a distinguished southern agriculturist be heard: "The great error," says our author, "of southern agriculturists is the general practice of exhausting culture—the almost universal deterioration of the productive power of the soil—which power is the main and essential foundation of all agricultural wealth. * * * The recuperative powers of Nature are indeed continually operating, and to a great effect, to repair the waste of fertility caused by the destructive industry of man; and but for this natural and imperfect remedy all these Southern States (and most of the Northern likewise) would be already barren deserts, in which agricultural labors would be hopeless of reward, and civilized man could not exist."

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* Patent Office Report for 1852–53.

In support of the allegations thus brought into view a mass of evidence might be adduced and a variety of illustrations presented and enforced; but it can hardly be deemed necessary to do so.

It is a singular fact, that, whilst suggestions of improvement in the commercial and manufacturing departments of industry are almost instantly appreciated and put in practice, those relating to agriculture, no matter how valuable, are often for a long time discarded. When Eli Whitney tendered his cotton gin, preëminently beneficial to southern planters, they should instantly have crowned him with riches and honors. He died in indigence; but the glories of his memory will not perish.

When Jethro Wood tendered to the northern ploughmen his cast-iron ploughshare, how often was heard the cold, incredulous remark, "It may possibly work in some lands, not generally; the old-fashioned plough is, after all, best; it is not so heavy; there isn't so much iron about it to break; and besides, the wooden chip and mould board of the old plough won't rust"! Thank Heaven, the iron plough is now the plough of the age, and Jethro Wood deserves a place in history among the benefactors of the world.

Thirty-four years ago, Henry Clay, himself an ardent lover of agriculture, in one of his eloquent speeches on the protection of home industry—a topic forever worthy of being pondered and studied by American citizens and American statesmen—spoke thus: "In one respect there is a great difference in favor of manufactures when compared with agriculture—it is the avidity with which the whole manufacturing community avail themselves of an improvement. It is instantly communicated and put in operation. There is an avidity for improvement in the one system—an aversion to it in the other. The habits of generation after generation pass down the long track of time in perpetual succession without the slightest change in agriculture. The ploughman who fastens his plough to the tails of his cattle will not own that there is any other mode equal to his. An agricultural people will be in the neighborhood of other communities who have made the greatest progress in husbandry without advancing the slightest degree." There is, perhaps, some comfort in the subsequent remark he makes—namely, that "many parts of our country are one hundred years in advance of Sweden in the cultivation and improvement of the soil."

We doubt not our farmers of the present day, compared with their predecessors, are mending in regard to the accepting of improvements; but their tastes and habits in this respect are greatly susceptible of advancement and further culture.

Agriculture is a great national concernment. It has a right, therefore, so far as it is constitutionally practicable, to require the fostering care of government; and that this care, to a greatly beneficial extent, may be given, need not be disputed. Permit me here to present the sentiments and language of the "father of his country." Says Washington, in his message to Congress in December, 1796, "It will not be doubted that, with reference either to individual or national welfare, agriculture is of primary importance. In proportion as nations advance in population and other circumstances of maturity this truth becomes more and more an object of public patronage. Institutions for promoting it grow up, supported by the public purse; and to what object can it be dedicated with greater success than the establishment of boards composed of proper characters, charged with collecting and diffusing information, and enabled by premiums and small pecuniary aids to encourage and assist a spirit of discovery and improvement? This species of establishments contributes doubly to the increase of improvement, by stimulating to enterprise and experiment, and by drawing to a common centre the results every where of individual skill and observation, and spreading them thence over the whole nation. Experience accordingly has shown that they are very cheap instruments of immense national benefits." And he then proceeds to urge upon the consideration of Congress the expediency of establishing a national university, doubtless embracing within its scope the promotion of agriculture.

Since the day Washington thus spoke fifty-eight years have rolled away, and no such care as he urged has been afforded. If the requirement was judicious then, is it not pressing now? From unquestioned, governmental authority we have the fact that the existing millions in the country, by improvident and unskilful management of the soil, have reduced its natural fertility one-third. This is a startling fact. What are the promises for the future? If twenty-two millions of people destroy one-third of the fertilizing capacities of the lands, forty-four millions at the end of another quarter of a century may consume the residue. We are said to be a nation of farmers. Are we a nation of farmers scourging the earth?

The rapid growth of our population, the present condition and prospective state of the nation, call for a great national agricultural reformation, aided by the countenance of the general government.

THE WASTES OF AGRICULTURE.

From an Address before the Housatonic Society.

BY HON. GEO. S. BOUTWELL.

Farmers cultivate too much land. This observation is old; for it is so true, and its truth is so apparent, that it must needs be old. For the reason that the manufacturer economizes his power of water or steam, or the trader his capital by diminishing his credits, or the merchant his voyages by increasing the speed of his vessels, the farmer should limit the amount of land in cultivation as far as practicable.

It is true, to an extent much beyond the common opinion, that the cost of a crop per ton or bushel is diminished as the aggregate per acre is increased; that is to say, a bushel of corn at twenty per acre costs more than a bushel at eighty. The same observation is true of every product of the land. The agriculture of Massachusetts from 1840 to 1850 was a process of deterioration and exhaustion.

It was altogether a retrograde movement, and the lessening crop per acre, year by year, was so serious as to threaten the existence of the interest. It is hoped that the present decennial period will show a better result. In the year 1850 we cultivated two million one hundred and thirty-three thousand four hundred and thirty-six acres; and allowing one acre for twenty bushels of wheat, for fifteen bushels of rye, for sixty bushels of corn, for forty bushels of oats, for one hundred and fifty bushels of potatoes, for thirty bushels of barley, for one and a half tons of hay, for one hundred dollars' worth of orchard products, for two hundred dollars' worth of garden products, and seven acres for the pasturage of every horse, five for every ox, four for every cow, two acres each for young cattle, one acre each for sheep, and allowing liberally for other crops and uses, the product of that year ought to have been obtained from one million seven hundred and seventy-two thousand five hundred and eighty-one acres—showing a loss of the use of three hundred and sixty thousand eight hundred and fifty-five acres—equal to about seventeen per cent. of the land in cultivation. This loss is obtained upon the aforegoing calculation of crops; but, as I shall have occasion to say hereafter, the loss will appear much greater if compared with the returns of 1840, when the actual results exceeded the estimate I have now made. The first waste to be pointed out is the use of this large quantity of land, which, if allowed to run to wood merely, would yield an annual average of one cord per acre, or three hundred and sixty thousand cords per annum. If this wood be estimated at one dollar and fifty cents per cord, you have an annual loss, or waste, of five hundred and forty thousand dollars. In the next place, this great quantity of land would be much benefited by allowing it to lie idle; for it is a general rule that Nature yields a growth and improves the land at the same time, while what often passes for husbandry leaves the land poorer than it finds it. Now, then, let this area of land rest for forty years untouched by the hand of man, and it will yield an aggregate of twenty million dollars, while its productive power for the future will be greatly increased.

Then, as a consequence of this system, the farmers of Massachusetts fence, plough, sow, and mow six acres, when they ought to fence, plough, sow, and mow but five; and, in fine, they extend all their agricultural operations over seventeen per cent. more land than is necessary to the result they attain. Here is a manifest loss of labor—a waste where there ought to be the strictest economy. It may not be easy to estimate this waste accurately; but it is plain that it materially diminishes the profits on this branch of industry. We have already estimated the entire cost of our agricultural labor at sixteen million five hundred thousand dollars. It is moderate to say that one-eighth of this is wasted in the cultivation of seventeen per cent. more land than is necessary to the crop; but, to avoid any unreasonable calculations, it may be well to put the loss at one-sixteenth, or one million dollars. Be it remembered that the gross proceeds of agriculture do not exceed twenty million dollars; and of this, at least one million is wasted in the misapplication of labor. Nor is this all. We shall have occasion to say that this misapplication of labor is followed by a more serious loss—in the exhaustion of the land. But what would be said of a manufacturer who should be guilty of wasting one-twentieth of his whole product in the application of his labors? If his labors finally resulted in bankruptcy, would he be entitled to public sympathy? or would judicious men condemn the business because it failed in such hands?

It is a duty to economize labor. Labor is the scarcest and dearest commodity in the market; and so it is likely to continue.

Again: this waste of labor is followed by a waste of land. When we cultivate more land than we ought for the crop we get, the process of cultivation is necessarily defective and bad. This was the character of our farming during the whole of the last decennial period.

As the land under bad cultivation loses heart and strength, more and more is required to meet the demand we make. So, then, from 1840 to 1850 we not only cultivated more land than we ought, but we actually consumed it at the rate of many thousand acres a year. The produce of 1840 was much greater than that of 1850; yet we had two million one hundred and thirty-three thousand four hundred and thirty-six acres in cultivation at the latter period, and only one million eight hundred and seventy-five thousand two hundred and eleven acres at the former. The product of 1840, at the rates before named, would have required two million three hundred and seventeen thousand six hundred and ninety-six acres, while they were really produced from one million eight hundred and seventy-five thousand two hundred and eleven acres—showing that my estimate of the capacity of our soil under ordinary care was too low. If you take the excess of the crop of 1840 over that of 1850, and, according to the rates before named, find the quantity of land necessary to produce that excess, and add that quantity to the acres in cultivation in 1850, you will have two million five hundred and seven thousand three hundred and fifty-three acres, or six hundred and thirty-two thousand one hundred and forty-two acres more than were cultivated in 1840. These statistics, though not altogether reliable, demonstrate two facts—one absolutely, and the other approximately. First, that during the last decennial period our lands continually depreciated in productive power; and, secondly, that that depreciation was equivalent to the annihilation of sixty-three thousand acres of land a year, or nearly three per cent. of the value of the farms of the State, exclusive of buildings and woodland. In fine, it appears that in 1850 we were cultivating six hundred and thirty-two thousand one hundred and forty-two acres more than we should have been if the production of 1840 had been sustained; three hundred and sixty thousand eight hundred and fifty-five acres more than would have been necessary at the rates before assumed; and also that the impoverishing culture from 1840 to 1850 was equal to an annual waste of sixty-three thousand two hundred and fourteen acres, which was apparent in the diminished total product and in the increased quantity of land in use.

This waste may be estimated with considerable accuracy. The farms of the State were valued at one hundred and nine million seventy-six thousand three hundred and seventy-seven dollars. Two and nine-tenths of one per cent., the exact proportion which the annual waste of land bore to the quantity in cultivation, is three million one hundred and sixty-three thousand one hundred and forty-five dollars. But if you allow that one-half of the total value of our farms is in woodland and buildings, the depreciation was one million five hundred and eighty-one thousand five hundred and seventy-two dollars per annum. But, whatever may have been the exact depreciation, it is plain that our culture from 1840 to 1850 was an exhausting one—the acres continually increasing, and the production diminishing. These facts demonstrate what it is unpleasant to believe, and yet more unpleasant to say, that the farmers of Massachusetts of that period could not, as a class, be called good farmers. Good culture benefits land; bad culture exhausts it. During the ten years to which our statistics refer the culture of the State was bad. Land reclaimed from the water and the forest was not used to increase production, but its native fertility was required to supply those crops which our exhausted and abused fields refuse to furnish. The process of our agriculture was that of a corporation which uses its capital in dividends, or a merchant who lives beyond his means, and it tended to the same result—bankruptcy. The idea that cropping land necessarily exhausts it is an erroneous one; and it is, moreover, a reflection upon the Creator, who has provided for the support of his children, and not for their extinction by the exhaustion of the powers of Nature.

The good farmer will so manage his acres that their productive power will yearly increase; and this he should do, even though his acres in cultivation diminish.

I beg, in concluding this part of my address, to present an aggregate of the wastes to which I have already called your attention:—

1st. The annual income from the growth of wood on three hundred and sixty thousand eight hundred and fifty-five acres of land more than was necessary for the crop of 1850, . .	$540,000 00
2d. Loss of labor in cultivating this excess of land, ...	1,000,000 00
3d. Loss of land per year by exhausting culture,	1,581,572 00
	$3,165,572 00

This waste is equal to two and nine-tenths of one per cent. on the value of the farms; and if it had been saved and added to the actual income, that income would have amounted to five per cent. a year. Admit that the calculations I have presented are true; and admit also, what I am sure is not true, that all the wastes have been stated and all the profits of farming enumerated; and even then the result to which we come is not an unsatisfactory one; for we are to consider that an investment in land which pays for the labor and other expenses bestowed upon it, and yields an annual income of five per cent. besides, is as good an investment as can be made. There is no risk of frauds and bankruptcy as when you purchase stocks or lend money.

It is to be considered that this result has been attained without reference to an improved cultivation, which is to follow the dissemination of scientific and practical knowledge among farmers. The view taken contemplates only that amount of skill which the farmers of Massachusetts are known to possess; and it is my desire further to show that its proper exercise will place them above the evil of low profits.

In farming, three things are necessary—skill, labor, and implements. Proceeding upon the basis that the skill of our farmers is sufficient for the present inquiry, I have next to say, that there is as much labor employed upon the farms of Massachusetts as there ought to be, when we consider the claims of other branches of industry. The great practical question is, how to economize it so as to produce the best results. The skilful farmer makes a judicious selection of his implements and keeps them in good order. He can no more afford to work with poor tools than the manufacturer can afford to use worn or antiquated machinery.

Among the agencies, if not among the implements, employed in agriculture in this region, we are certainly to reckon manures. They are to the farm what water or steam is to the mill. As the want of these, or their excessive cost, ruins the manufacturer, so the want of manure, or its great cost, hurries the farmer to the same end. The advance made in agricultural knowledge in the last five years has changed public sentiment on this point; yet it is feared that the remedy has been found in the purchase of expensive manures from abroad rather than in the prudent husbandry of the resources we have at home. And the conclusion of this address will be devoted to an inquiry into the amount of waste in this respect in Massachusetts. If it is profitable farming to purchase guano, phosphate, and animal manures from abroad, there is certainly no excuse for neglecting the means which every farmer can command at a small expense. He who neglects his harvest is hardly distinguished from the criminal; yet it is common to neglect the preparation on which the harvest depends. A waste of the manure is a waste of the elements, and renders it impossible for us to add to our crops or to improve our land. The first thing to be done, then, is to economize the manure we have at home, and there may then be hope of general and permanent improvement. It may be better to import manures than to be without them; but of all importations it is the least creditable to the country while the present customs remain.

By the census of 1850 it appeared that there were seventy-five thousand barns in the State; and the Secretary of the Board of Agriculture estimates the quantity of manure at five cords each, worth three dollars per cord—making a total of one million one hundred and twenty-five thousand dollars. If we assume, what appears liberal, that one-fourth of the barns have cellars, it follows that three-fourths of this manure are exposed to atmospheric and other deteriorating influences. Many competent persons estimate the loss from this cause at one-half; but if it is only one-third, we show a waste from the exposure of manure of 'two hundred and eighty-one thousand two hundred and fifty dollars per annum.

Nor is this all. Without a barn cellar it is impossible to secure the stale, which is nearly equal in value to the solid, manure. Stöckhardt estimates that, of the manure of neat cattle, fifty-three per cent. is solid, and forty-seven per cent. i stale. Farmers who neglect the latter ought not to be purchasers of foreign manures. If the calculation of the Secretary is accurate, this waste is three-fourths of forty-seven per cent. of one million one hundred and twenty-five thousand dollars—which is seven hundred and forty-eight thousand two hundred and thirty dollars. There is, then, an aggregate waste in the State, in the matter of manures, of one million twenty-nine thousand four hundred and eighty dollars, which might and ought to be saved. It may be mentioned incidentally as the observation of a practical farmer, and its truth has been established by experiments, that gravel or subsoil is a much better absorbent than soil which has been cultivated.

There are other losses of manures which amount to as much as that which has been mentioned.

A few farmers have built reservoirs for the waste water of their houses; yet much the larger number neglect this means of wealth altogether.

I think it safe to say that the farmers of Massachusetts neglect and waste more manure than they use; and the loss of a million of dollars in manure is followed by a loss of much labor and many millions in the crop.

It is also practicable and economical for many farmers to avail themselves of manures or fertilizers from the shops and mills of the manufacturers. The dirt and waste of woollen factories are found to be a superior manure for potatoes.

The liquor and deposit of the rag bleacheries are of inestimable value. They contain lime, soda, and whatever may be extracted from the rags. The value of this composition is apparent, and must be great in most sections of New England. An intelligent manufacturer and farmer, who has had many years' experience with this fertilizer, writes that, where used upon land in the immediate vicinity of the bleachery, its value is equal to the cost of the lime and soda. There are also many other manufactories from whose ordinary operations wealth, or the means of wealth, may be derived.

SAVING OF MANURES.

From an Address before the Norfolk County Society.

BY REV. JAMES RICHARDSON.

Treasure up every particle of liquid or solid matter that can enrich and nourish your lands; let nothing escape you. Forest leaves, wash of the streets in the wayside gutter, turf and sods, decayed wood and brush, chips and shavings, earth from the wood shed and barn yard, the drip and cleanings of stables, hog pen, vault, pigeon house, poultry yard, and ash bin, and, on the coast, the precious kelp, and even the seaweed, with the choice bones, oyster shells, and clam shells, waste of woollen factories, scraps of leather, and even coal ashes,—all have their uses, all are to be considered manures, or matter capable of enriching in some way the soil, and all are to be carefully economized. I have known a coarse, sedgy marsh to be reclaimed and brought to yield good English hay by the mere application of coal ashes. And care must be taken in the proper preparation as well as saving of these materials. See to it that your stables, vaults, poultry houses, &c., are filled with proper absorbents, or materials to hold the liquid and volatile portions of the manure—such as clay, plaster, charcoal, and especially peat earth and ditch mud mingled with leaves and chips, that also contain a valuable supply of carbon, &c. The manure of a dozen fowls, well saved and mixed, is sufficient dressing for a large garden; and that from a goodly flock of hens and pigeons, properly composted, will abundantly enrich a small farm. The inhabitants of the Celestial Empire, or, as they name it, "the Central Flowery Land," the most famous agriculturists and horticulturists of all the world, in whose territory, from reverence to our primitive, fundamental, and right royal art, the emperor himself holds the annual plough,—whence come the floral splendors of Azalea and Camillia, Aster and Peony, and choicest roses,—employ as their only manures the excrements, solid and liquid, that have been allowed among us of the Occident for centuries to escape and taint the household air from long, fetid, and pestilent vaults, and that we have in past ages discarded as useless. And, had I the direction of the agricultural societies in our land, I would offer the first, and by far the largest, premium for the best mode of saving, preparing, and applying this manure, and the second for the economy and preparation of each and every kind of nutritious compost. Then fill up your barn cellars, and vaults, and sink drains with clay, peat, mud, &c., that shall absorb every particle of the liquid and gaseous elements, and thus fulfil the Scripture precept—"that nothing be lost;" and remember to keep always a barrel to dissolve your bones and shells in moistened ashes.

Next comes the proper application of manure; and here what the envious hour forbids me to speak, that I shall ask you, brother farmers, to read in print at your homes. And with the application of manure rises the consideration of the analysis of soils, the doctrine of specifics; and so on. And here I catch a faint muttering in the corner from my gruff old friend, to whom book learning and book farming were so distasteful, in which, however, I am able to distinguish the phrase, "new-fangled humbugs." Allow me, however, to say, my friend, there is no humbug about it. How are you to know, I pray you, what elements your soil needs unless you have ascertained by analysis what it already contains? I grant you there may be careless examinations by unscientific men; but would you forever be carrying coals to Newcastle, the mother of coals, or ship lime to Thomaston? What would you think of a farmer who was carting ashes on to a tract of new land just burned over, spreading gypsum on a calcareous soil, or teaming ditch mud on to a peat meadow? It may be that a certain piece of land only requires one single additional element,—lime or potash, carbon or ammonia, perhaps,—and has a surplus of the other elements necessary to vegetable growth. What use, then, of wasting your time, labor, and manure in adding to that surplus, when a little plaster, a little super-phosphate, or a little ashes, perhaps, would be amply sufficient, and the only thing required? Some elements—such as the phosphates for example, those abounding in virgin soils—have been well nigh exhausted in lands long tilled. What marvellous tales they tell of the prolific character of the new soil of California! Wheatfields producing at the rate of seventy-five bushels to the acre; potatoes, one of which makes a meal for a large family; beets bigger than babies; carrots the length of tall men; with cabbages of sufficient size to take the place of a farmer's family dinner table! What equally wonderful stories, and all true, they told, a quarter of a century ago, of Ohio and the West! And what wheat crops, what great healthy potatoes, were raised by our fathers here in New England formerly, which we can't raise now, and that at an era, too, when they despised all manure, and when it was poison to the land! And where is it gone, this land, that yielded of yore the rich harvests of wheat? Over the back of old roan, or the bay mare, our grandsires carried it in bags. It has all gone to mill years and years ago. Out of it have been manufactured the heavy oxen, the bones and bodies of milk-giving cows; from it the strong stalwart forms of our fathers were well knit together, and the rounded, seemly shapes and glowing cheeks of fair matrons and gentle maidens. Gone to mill, ground and eaten up has the land been, long ago—those elements of it, at least, strong for wheat, and productive of the rich full ears of heavy grain, and none of it was ever carried back and replaced. And the question arises, How shall we bring back this scattered soil? Plainly by ascertaining what these lost elements are that have thus been carried away and consumed, and returning them or their like again to the soil. An old farm is like an old wagon or an old house. I don't know that it is ever quite so good as when it first comes from the maker's hand.

But we have got the old house; and what shall we do with it? Let us examine it thoroughly and see. It is strongly built, and the sills are still good; but the old roof may have to come off, and the clapboards be renewed; or perhaps a good coat of paint is all that is needed to make it quite as spruce and genteel as the little light-framed thing there over the way. Some grand old houses do I know, here and there, made over and a little modernized perhaps, that, ten to one, you would call splendid new mansions. And so, my friends, with our old farms. We must look them over, and examine them thoroughly, and see what is wanting; the old sills, the foundation, rocks, and subsoil there is no fear of. On some places the shingling of vegetable mould has been washed away; but the paint that makes them fresh and new, the elements that touch them with hues of deep and living green, that give the bright, rich, luxuriant aspect, are wanting. Perhaps a mixture of a little lime and carbon, or ammonia and phosphate, will furbish up the ancient farm, and make the old acres look up bright and shining again. Don't be afraid of modernizing the old house, the old land, making continually new improvements, and returning the lost elements of the once virgin soil, that shall bring back to it its early paradise. It is through such examination and analysis of the old soil alone that we can make the proper, necessary, and economical application of manures to our well-worn fields, and reap again luxuriant, bountiful crops.

The whole subject of specifics we are driven to pass here, with the single remark,—from which may easily be gathered the whole philosophy and its application,—that every member of the vegetable kingdom has its own peculiar soil, in which it best flourishes. Some belong to the marshes; some revel in the mountains; others love the sands; and still others the rich intervals of the fertile rivers. And while certain elements contribute to the growth and ripening of fruits, others tend only to leaves and wood. The principle is true in regard to vegetables and animals; it is also true in regard to man.

AMERICAN AGRICULTURE.

From an Address before the Bristol Society.

BY HON. J. W. MILLER.

The extent and fertility of our lands have produced new and striking developments in agriculture. Operating upon a field as bountiful as it is boundless, and aided by great variety in climate and soil, its productions are not only vast and varied, but of a character and kind to satisfy the wants of the world. Art and labor had well nigh exhausted their powers in meeting the pressing demands for food and raiment. A more reliable source for the supply of grain, and a cheaper raw material for manufacturers, were the two great necessities of the world. The agriculture of the United States has met the emergency; and Indian corn and American cotton have relieved the wants of humanity.

Agriculture, under these enlarging influences, assumed a controlling position. No longer a new employment, it has become a power in the state. It is a great conservative power, founded upon the land and regulated by the owner of the soil; giving stability to government and progress to the people; checking the fury of democracy, thwarting the wild schemes of politicians, relieving the disasters of domestic trade, and regulating the balance of foreign commerce. It is a grand industrial, productive power, which, year by year, not only sustains in comfort and luxury twenty-five millions of people at home, but also supplies the annual demands of foreign countries, and out of its inexhaustible granary relieves the famine of nations.

But the high and influential position to which agriculture has attained in the United States has thus far been rather the work of Nature than of Art. We have been reaping a new field and gathering harvests from a virgin soil; and, though the field may be wide and the soil deep, Nature, in her greatest exuberance, may be exhausted by extravagance or wasted by neglect.

Our land policy is governed more by the spirit of acquisition than by the duty of improvement. Annexation, and not cultivation, is the great effort of both government and people. Such a system may acquire a wide domain, where millions of men may for a time luxuriate upon the bounties of Nature and erect temples to Liberty and altars to Bacchus; but without the educated efforts of an intelligent yeomanry to apply the aids of arts and science, to renovate the soil and multiply its productions, temples and altars, like the shrines and palaces of Rome, may survive in majestic poverty the productive energies of the land, and these great acquisitions become a barren domain of worn-out lands—a mighty waste of Nature disfiguring the map of the world.

The danger which threatens the prosperity of our agriculture lies in the superabundance of its resources. Ignorance and indolence may enjoy, in common with intelligence and industry, the overflowing fountains of Nature; the abundance of our lands and the liberal policy of our legislation may give to every man a farm; but neither land nor laws can make every man a farmer. Nature, more prudent than governments, husbands her resources, and will only continue to yield her treasures when sought for by the cunning hand of skilful labor. Barbarians may for a time feast upon the primeval fruits of the earth, and the brute force of a higher association, sufficient to deal with Nature's rough and rugged materials, may clear the ground of trees and rocks, and gather large crops from new lands; but progressive husbandry requires other and higher agencies; art must come to the aid of manual labor, and science to the relief of exhausted nature. The farmer must be educated, and his employment elevated to its appropriate sphere as a liberal art, that our fields may be saved, not only from reckless waste and premature decay, but renewed and strengthened in their productive powers, to meet the wants of an increasing population.

Under this comprehensive view agriculture presents itself to the contemplative eye in three distinct aspects—as a necessity, as an art, as a science. When viewed as a necessity, the mind is carried back to the cloudy period of unwritten history, when, the forest and the chase not sufficing for his wants, man was constrained to solicit vegetable diet from the bosom of his bounteous mother—Earth.

The origin of government, the dawn of legislation, the crude elements of civilization, and the first essays of the plough are nearly contemporary. Situated within the *terra incognita* of primeval antiquity, let us bequeathe such theories to the speculations of philosophy, and pass on to that epoch when a still augmenting population demands a commensurate supply of food. The rude cultivators of this second period, living dispersed at wide intervals, without communication by roads, and isolated within the seclusion of a domestic circle, suffered the disadvantage of knowing nothing beyond the results of their own individual experience. Gradually this obstacle to progress was removed; neighborhoods and villages brought their knowledge into a common focus.

Various contending practices were contrasted. The head was now summoned to coöperate and act in unison with the hand; and agriculture thus became an assemblage of customs, habits, and traditions, unconnected by any pervasive theory. And for thousands of years did agriculture thus continue a mere art,—embellished, indeed, by Virgil in all the fascination of poetry,—yet still a shapeless, empiric art, without connection, rotation, mutual dependence, or principle. During this prolonged period the human mind seems to have slumbered in stupefied fascination over every subject of inquiry. Men talked, argued, imagined, supposed, but never dreamed that fact, experiment, demonstration were the sole basis of rational generalization. Bacon struck out this fundamental truth; and henceforward the researches of philosophy were guided in a new path, and science awoke to renovated life.

This may be called the transition period, at which every subject of human inquiry assumed a fresh character and aspect. And Agriculture, pursuing slowly but steadily the upward path, now stands proudly with Chemistry on her right hand and Mathematics on her left, sending Commerce to the Pacific in quest of manures, employing Hydrostatics to drain and irrigate, and Mechanism to contrive implements of incredible potency.

Perhaps, in strict parlance, agriculture is too practical, and not sufficiently abstract, to be classed among the sciences. It is rather a concentration of principles and facts collected from every source and applied to the most extensive and beneficent of possible purposes. If not a veritable science, it is an art, upon which every science has set its seal to certify the beauty and dignity of this foster-mother of mankind. The bird which perches upon any branch of the tree of knowledge is, and has a right to be, esteemed noble. Whence comes it, then, that the votaries of a pursuit, demanding industry, learning, and intelligence, fail to enjoy that deferential regard which envelops the learned professions in an atmosphere of respectful consideration? Before an answer could be framed for this query, it is necessary to clear away an impediment which obstructs the very threshold. A cant phrase has of late become current among demagogues, who burn incense before a wooden idol, which they are pleased to christen as the "dignity of labor." This complimentary adulation may catch voters at the polls, but conveys a fallacy inadmissible when we are in search of sterling truth. There exists neither dignity, nor a phantom of dignity, in labor unconnected with intelligence. On the contrary, sheer muscular effort converts a man into a machine—the instrument by which the power of inertia is overcome, and particles of matter removed from one position into another. This function may be performed by every mule, water wheel, and steam engine in the land; but when strength is actuated by a laudable object, and guided to its intended results by combined intellect and knowledge, then indeed labor becomes venerable. Only as the joint offspring of mind and matter is it clothed with dignity. To consummate this nuptial union of action with study and reflection, to connect labor, thought, and science by a holy alliance, and thus to confer a real dignity and efficiency upon three-fourths of the human race, is the high problem reserved for solution by this nineteenth century. Let us review some of the means of achieving an enterprise which, if any thing mortal can be so characterized, is indeed godlike. Had man been created without the gregarious instinct, he would ever have remained a mere barbarian. The ideas and experience of a solitary savage perish with him; the ideas and experience of millions of savages congregated during thousands of years, thrown by juxtaposition into one fermenting and teeming mass, have transformed this savage into a philosopher. Armed with the telescope and the microscope, the chemical bath and the electric battery, the pristine barbarian now unveils Nature, traces her combinations on this our globe, and announces her laws amid the inaccessible orbs of the Milky Way. The smooth marble is not self-polished, but derives its lustre from the friction of another similar fragment. The rough mind becomes polished by friction against other minds equally rough. Association, then, reciprocal movement, interchange, are the sole basis of improvement, alike in rational and material, in mental as well as in physical, constitution.

The operation of this gregarious tendency is counteracted among farmers by the very nature of their pursuits. Their residence must necessarily be separated by considerable distances; and the brief intervals of labor can be enjoyed only occasionally in familiar intercourse.

Hence the distinction between urban and rural population—between the acute, bustling, sharp-witted, speculative artisan, and the slow, steady, reflective, sagacious husbandman. To compensate this disparity, the social principle must be summoned into activity; and agricultural societies seem the best, nay, the only, practical remedy. Celebrations, then, such as this, which now concentrates a wide district, may be considered as the preliminary step towards the realization of the true dignity of labor. Remote friends are here collected to interchange ideas and experiences, to compare machinery and practices, to distribute novel seeds or exhibit choice animals, and, beyond all, to exalt the intellectual faculties by emulation and reciprocal contact. This goodly company is a whetstone to sharpen ingenuity, a stimulant to amicable and honorable rivalry, a friction of mind against mind, polishing and invigorating at every encounter.

Thus can the union be consummated between reflection and action, between acute mind and indefatigable body. The dignity of labor will cease to be mere cant when the sound mind, actuating a robust body, reconciles the maximum of produce to the minimum of effort.

It would be impertinent to enlarge upon the subject and merits of universal education while I stand upon the soil of Massachusetts, and amid a people whose high fame it is to be foremost, as well for liberality as for wisdom, in scholastic institutions. The paths to honor and fortune are so multiplied that a wide bird's-eye view of literature and science is the best preparation for active life; yet it might be possible to ingraft upon such a course of study the actual operation of agriculture. A farm and school were first associated in Switzerland. The idea has been adopted in many instances in America. And among the innumerable endowments which confer lustre upon your citizens, why are there none for the education of farmers, where young men can be taught, not only to work, but to know when, how, and why to work?

HIGH FARMING.

From an Address before the Plymouth Society.

BY R. MORRIS COPELAND, ESQ.

High farming means good farming, thorough cultivation, a comparative disregard of drought, large crops, well-filled barns, and happy faces; and as it matters not how much manure you put upon badly-prepared land, or what seed you sow, we will devote the balance of our time to a few considerations as to the best method of getting the land itself into the best possible condition. The greatest obstacle in the path of successful culture is the excess or want of water; and if any means can be found to render us independent of it, the remainder of good culture is easily learned. No idea now is more generally prevalent than that if we should abandon, perhaps, the cultivation of some of our barren uplands, and subdue the rich lowlands, we should more rapidly increase the yearly balance; and this is very true; and yet but few have any real idea how or why lowlands can be made the best part of all our farms.

The Report of the Secretary of the Board of Agriculture says that six thousand acres are annually reclaimed, and when properly reclaimed will be able to yield from two to three tons of hay to the acre per annum. As hay has had in the eastern part of the State, for the past few years, a net value of ten dollars, this land would yield as interest upon the cost, then, from twenty dollars to thirty dollars per annum; and yet it would be safe to say that not five hundred of those acres are properly reclaimed or capable of doing their best. Draining is the chief step in improving our land. The removing standing water is not the whole effect. There is a meaning to draining much deeper than is commonly supposed; and more than one-half of our upland farms would be drained to advantage.

Wet lands are technically termed cold and sour. Carbonic and other acids prevail largely, and prevent the generation of a healthy vegetation. When air can penetrate under the surface certain chemical changes take place, which render those gases innocuous, and which so decompose many of the compounds of minerals and salts as to alter their hitherto injurious natures and make them directly conduce to vegetable growth.

But more than this: without warmth there is no vegetation; and in cold lands only a few crops will mature. Of course, so long as the sod is full of water, air cannot penetrate or carry in the sun's warmth, whilst under the sun's rays evaporation is rapid.

The absorption of water into the soil expands it; upon its evaporation it contracts and cracks,—peaty soils to the amount of one-fifth,—and rapidly bakes into a hard crust; for, in proportion as the water evaporates, the earth tends to return to its original structure; and as the presence of water forbids the entrance of air, and as contraction keeps pace with evaporation, when the water is fairly gone the earth is closely locked up.

But by thorough drainage the water is drawn away early, so that the warm spring air may sweeten and enliven the whole; then the plough may go down as far as the ploughman wishes, and the growing grain delights the beholder.

In a climate like ours, and particularly with such a spring as that last past, no means for the early disposal of superfluous water should be lost. It has been found by accurate experiment that the difference of season between parts of the same land drained and undrained was two weeks.

The past season has called the attention of every one to the necessity of some changes in our culture that may enable us to withstand the evils attendant upon water, whether its excess or absence.

The spring of the present year was rendered extremely late by its coldness and wetness, so that in some places vegetation was delayed several weeks, and had hardly got established before it was seized by the summer drought. Now, the question is, before manures and every thing else, How can we remedy this difficulty? By drainage in the lowlands, and some dressing for the uplands that will condense moisture and retain manures. Every evil in nature has its remedy. Not only can we make our peaty lowlands fertile as gardens by drainage, but this very peat is the true regenerator of your sandy soils, together with the after-application of carboniferous manures and kelp.

I will not detain you by a description of the process of evaporation and its effects upon the matter whence the water is taken away, nor make any explanations to fix these facts in your minds; for the following comparison between a solid substance like a brick, and a loose one like peat, will tell the whole story. Take a brick and a mass of peat of equal weight and dryness and get them equally hot. The brick is very close, and will hold its heat a long time, as you know; the peat is loose, and will soon lose it by radiation; the structure of peat allows the cold air to enter freely where it will become warm, and it will then rise and give place to colder air from above; nor, from the equilibrium of things, can it get warm without taking a proportionable amount of heat from the peat. Now, as you know, the air always has some moisture in it, and, when it is perfectly full, will deposit it as rain.

The capacity of air to hold water depends on how hot it is; for, if you put a dish of cold water in with hot air, it becomes steam, and by some invisible means is conveyed out of the dish and out of sight. The air which was filled partly with moisture now has just as much more in it than before the water evaporated as the bulk of the water was. But, as you know, when air is subjected to heat it expands, so that our heated air might have been of much less compass once, and by cold may be again, If, then, we bring it into connection with a cool body, the particles of air will become cooled, reduced in volume, and unable to retain the same amount of moisture as before, and will therefore deposit it upon this cool substance. This is the process of every summer night. The earth cools by radiation, or evaporation; the air next to it becomes cool and unable to retain its moisture, which it deposits upon the surface as shown.

By following me through these steps, you have seen why the brick, and dry earth like it, from their impenetrability to air, are less easily cooled and attract less dew than the peaty earth, and why it is desirable to prevent the surface from becoming hard during the spring evaporation, lest it become too hot afterwards.

This radiative and evaporative power, in connection with a capability of absorbing moisture, is the chief test of the value of soils for cultivation. You thus see that our peaty meadows, to be rendered desirable in spring, must be relieved of their superfluous water, not only because the process of evaporation is extremely slow, but because its effects upon the summer drought are disastrous, and, when properly relieved of their water from their absorptive powers, (that is, the tendency to attract and condense moisture,) are extremely desirable for summer culture; and therefore the relative value of soils depends upon their relative power of absorption and evaporation in the same time.

We thus see why the light, sandy soils of Plymouth County are the least desirable for summer tillage, and also how best to improve them, by the addition of clay, next peat, and last carboniferous manures. Peat or clay makes a matrice or bed in the sandy soil, and will hold not only the manures applied, but will also very much increase the moisture during the summer and moderate the tendency to excessive heat. I have put clay first for sandy soils because its powers of absorption surpass that of all other bodies. It would seem that, because dark colors most readily become heated, peaty soils would soon become hot; but, as I have said, the mechanical nature and high evaporative powers of the material prevent this; and whilst the dark color would tend to warm them more easily in the spring, the peculiar texture particularly attracts the moisture in summer. Thus, if you would be good farmers, care less at first about manure; get the peat from the meadow, the clay from the bank, and give your soils as good dressing as is possible for the basis of all future operations.

It is generally supposed that a peaty soil is good for nothing but grass, and meadows, therefore, are almost always laid down to grass; but such is not true. A well-drained, deep, peaty soil is better for general crops than any other, the circumstances being the same.

In several of our Massachusetts towns, the heaviest corn crops, and those which have taken the premium, have been on reclaimed meadow land; but, whilst many now admit the benefits of under-draining, few are aware how best to go to work, or are willing to pay others for the information, where meadows are surrounded by upland, and there is sufficient fall to carry off the water.

It seems a simple matter to arrange the drains for the best effects; and yet such is not the case. I have never seen more than half a dozen well-drained fields.

In draining it is not enough to know that land is wet, or how to build the drain, or from which side of the field the water comes. The efficiency of drains depends quite as much upon the nature of the subsoil as the right location and construction; and a wise farmer would never hesitate to pay an agricultural engineer liberally for his services in pointing out the best localities and kinds.

My time is drawing to a close; and I have hardly mentioned one of the various improvements agriculture owes to the efforts of men of learning and book farmers. Had I time I could show you how, by a proper attention paid to the manure heap and the sewage of the house, the resources of the farmer might be more than doubled; how the innutritious portions of individual and animal food, by a wise provision of Nature, are enabled, by judicious application, to produce the food necessary to support that creature's life; how the manure crop is quite as valuable and important as the hay crop, and ought to be as carefully saved and garnered.

Perhaps you expect one who proclaims at start his adherence to books and theories to urge you to have scientific analyses made of your fields, which, followed carefully, would in the end be sure to fill your barns, or to buy and apply special manures, &c.

No; such is not my intention. I would urge upon each of you to carefully improve what you have got to the utmost before you begin to buy more.

Remember that peat and clay will render the most barren sands fertile, which no manure alone can; remember that drainage will put your peat and clay into a condition to yield the largest crops with but little manure, which, without drainage, will be never benefited by all the manure you can apply; and, finally, remember that no manure returns more than five per cent. of its value in the crop, and that, therefore, no matter how wet or dry your land may be, you cannot increase the relative yield due manure above five per cent., and that the surest way to get the most value from your manure is to so highly improve your land as to be able to get maximum crops with as nearly as possible minimum dressings of manure.

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